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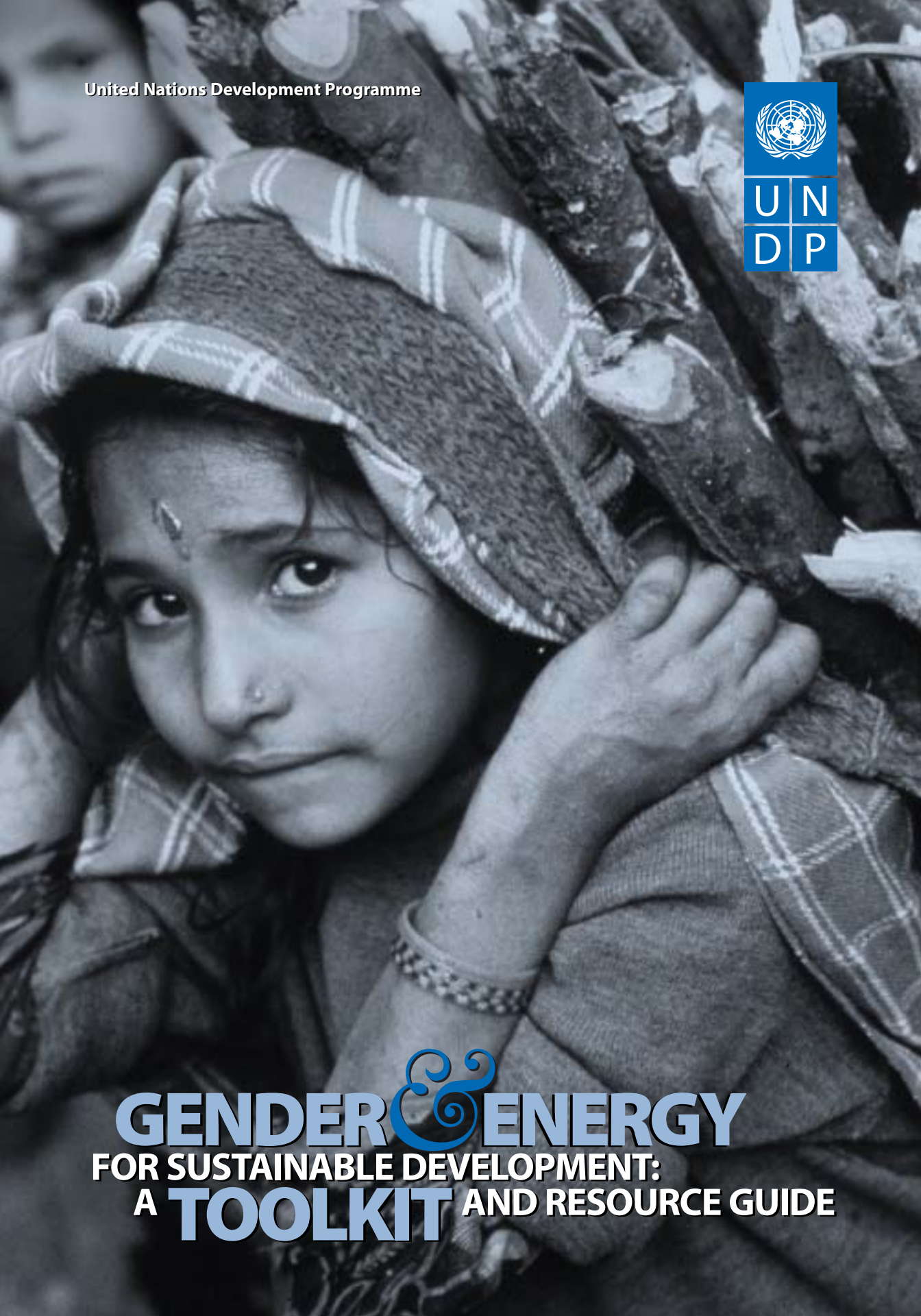

GENDER & ENERGY FOR SUSTAINABLE DEVELOPMENT: A TOOLKIT AND RESOURCE GUIDE

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FOREWORD

In 2005 the international community will gather to examine progress on gender and development issues in the ten years following the 1995 Beijing Fourth World Conference on Women. This event brought together representatives of government, civil society, media and grass roots organizations to look at the unique roles that men and women play in supporting development, economic growth and more equitable societies the world over. It had long been recognized, and was reaffirmed at the Beijing conference, that women face distinct challenges and opportunities in relation to the use and management of fuels and energy in household and economic activities. The document resulting from that event, the Beijing Platform for Action, makes specific recommendations concerning the need to address gender and energy linkages and the unique and often difficult situation faced by women in the poorest developing countries in particular. Since then other UN conferences including the Millennium Summit in 2000 and the World Summit on Sustainable Development in 2002 have called for the empowerment of women including through increased economic opportunities and enhanced access to cleaner affordable fuels and energy technologies.

The United Nations Development Programme (UNDP) in collaboration with ENERGIA is pleased to release this publication "Gender and Energy for Sustainable Development: A Toolkit and Resource Guide" which has been designed for use development practitioners, energy planners, community groups and gender experts on ways to address energy issues at the project and policy level. This publication builds on the ongoing analysis of UNDP, ENERGIA and a host of international and national experts. Its contents can be used to enhance energy projects, gender focused projects, or indeed development projects at large. We believe projects, programmes and policies that explicitly address the gender and energy nexus will result in better outcomes in terms of the sustainability of energy services as well as the human development opportunities available to women and men.

For many years energy projects were treated as gender neutral based on the assumption that energy bottlenecks and solutions impact men and women in similar ways. In most countries this does not reflect reality and has in fact led to "gender blind" projects which in some cases have not been successful due to the failure to look at the distinct situation of women and men in relation to energy production and use patterns. The tools presented in this guidebook have been design to help development practitioners ask the relevant questions needed to bring about better development and energy outcomes that are gender specific and that address the needs of women in particular. To accomplish this, an exclusive focus on "gender and energy" projects is not recommended. What we suggest instead is that all energy projects consider the differing role of men and women in relation to energy systems and that more broadly speaking, development efforts overall consider the role that energy can play in enabling or hindering successful outcomes.

The materials presented here have been peer reviewed and build on regional consultations, pilot projects and field research by gender and energy experts. We remain engaged in gender and energy analysis and programme support as part of UNDP's overall commitment to gender mainstreaming and hope you will find this publication helpful in your own efforts in energy and development.

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The provision of energy services in the form of "multifunctional platforms" in Mali has increased annual incomes for women by 50% and freed up to six hours of their time daily, creating conditions for better health, education and advancement. (Photo: UNDP/Multifunctional Platform Project)

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INTRODUCTION TO TOOLKIT AND RESOURCE GUIDE

1.1 WHAT IS THE PURPOSE OF THIS GUIDE?

This toolkit and resource guide has been produced jointly by the Sustainable Energy Programme of the United Nations Development Programme (UNDP) and ENERGIA, the International Network on Gender and Sustainable Energy. It is designed to help planners and practitioners integrate gender and energy considerations into development programmes, including those focusing on energy improvements as well as other types of development programmes.

In many parts of the world, overall socio-economic development is limited by the lack of availability of modern energy services such as lighting, cooking and heating, refrigeration, pumping, transportation, and communications. The lack of access to energy services is known as "energy poverty," a condition that often has disproportionate effects on women and girls.

This toolkit and resource guide outlines the linkages between gender and energy in the context of sustainable development and provides suggestions and materials on how to address energy poverty by integrating gender and energy sensitivity into development programmes, projects, and policies.

An important reason for the focus on gender and energy is that in many developing countries women are particularly affected by lack of accessible and affordable energy services due to their traditional roles, household responsibilities, and low social and political status. Better understanding of differences in the ways men and women use energy in various cultures and locations can promote greater gender equity and empowerment of women, as well as enhance the effectiveness of energy projects, poverty programmes, and overall sustainable development activities.

UNDP and ENERGIA have collaborated on a number of activities related to energy, women, and gender, and this guide builds on that work as well as on other, separate initiatives over the past several years. In 1999, UNDP initiated a project entitled "Energy and Women: Generating Opportunities for Development" to look at new approaches to the use of energy as a means of addressing poverty alleviation and the advancement of women. One of the project's key assumptions is that greater access to energy services can provide significant social and economic benefits, especially for women and girls in developing countries who are primary providers and users of traditional fuels such as wood, dung, and charcoal. ENERGIA has been a important partner with UNDP in its Energy and Women Project. Founded in 1995, ENERGIA brings together individuals and groups concerned with sustainable energy, the environment, and women. ENERGIA's goal is to engender energy and empower women through information exchange, research, advocacy, and actions aimed at strengthening the role of women in sustainable energy development.

1.2 WHO CAN BENEFIT FROM THIS GUIDE?

The toolkit and resource guide is meant to provide useful information on development approaches and activities relating to gender and energy concerns to a variety of planners and practitioners involved in sustainable development programmes, including:

- Multilateral and bilateral organisations, including UNDP country office staff,
- Government officials and decision makers in the energy sector and in other ministries,
- Women's interest groups in both the North and the South,
- Development project designers and implementers,
- Nongovernmental organisations (NGOs) and community groups,
- Donor organisations,
- Private sector companies involved in energy and development projects,
- Gender specialists and trainers interested in energy issues, and
- Social development specialists who recognise the role of energy in their work.

1.3 HOW DOES THIS GUIDE RELATE TO UNDP'S WORK?

MILLENNIUM DEVELOPMENT GOALS

The Millennium Development Goals (MDGs) adopted by the UN General Assembly in 2000 established a framework for development co-operation and co-ordination. The goals set targets for: (1) eradicating extreme poverty and hunger; (2) achieving universal primary education; (3) promoting gender equality and empowering women; (4) reducing child mortality; (5) improving maternal health; (6) combating HIV/AIDS, malaria, and other diseases; (7) ensuring environmental sustainability; and (8) developing a global partnership for development (see http://www.un.org/millenniumgoals). These goals were reinforced by the Plan of Implementation adopted at the 2002 World Summit on Sustainable Development, which also emphasised the importance of mainstreaming gender perspectives and recognised that access to energy can play an important role in efforts to eradicate poverty.

UNDP is the UN campaign manager and scorekeeper for the MDGs. At the country level, UNDP is working with governments to develop capacity for achievement of MDG targets and promoting consultations with key stakeholders to build support for policies and programmes that are truly pro-poor and pro-women.

Projects designed to increase poor people's access to energy for development can provide important entry points for achievement of the Millennium Development Goals if they consider how energy-related activities can have positive impacts on poverty alleviation, education, health, and environmental sustainability – as well as gender equality. (See section 2.3, "How are Gender and Energy Related to Achievement of the Millennium Development Goals?", for further discussion of these linkages.)

UNDP PRIORITIES AND PRACTICE AREAS

During preparations for the World Summit on Sustainable Development, the UN Secretary-General identified five key priority areas for action: Water, Energy, Health, Agriculture, and Biodiversity, collectively referred to as "WEHAB priorities." These sustainable development priorities are directly linked to achievement of the Millennium Development Goals (http://www.johannesburgsummit.org/html/documents/summit_docs.html).

UNDP's thematic practice areas relating to poverty reduction, democratic governance, crisis recovery and prevention, energy and the environment, and HIV/AIDS all work together to support developing countries in adopting strategies for reaching the targets for 2015 set out in the MDGs (http://www.undp.org/policy). UNDP views gender as one of three cross-cutting issues to be addressed in all the thematic practice areas. The other cross-cutting areas are capacity development and information and communications technologies.

This toolkit and resource guide outline linkages between gender and energy issues, the MDG targets, and WEHAB priorities.

GENDER MAINSTREAMING IN UNDP'S WORK

The third Millennium Development Goal sets targets to "promote gender equality and empower women." As part of its commitment to gender equality, UNDP has adopted a strategy of "gender mainstreaming." Gender is seen as a social construction defining the different roles of men and women in various cultures and regions (as distinct from sex roles, which are biologically determined).

A gender mainstreaming approach requires that gender equality issues be raised at each step in the project cycle. Moreover, UNDP aims to take account of gender concerns in all policy, programme, administrative, and financial activities, including decision making with regard to core policies as well as every-day implementation decisions (see UNDP's *Guidance Note on Gender Mainstreaming*, available on line at http://www.sdnp.undp.org/gender/policies/guidance.html)

1.4 HOW DOES THIS GUIDE FIT INTO ENERGIA'S ACTIVITIES?

INFORMATION DISSEMINATION AND EXCHANGE

Sharing information about gender and energy concerns in various regions and development contexts is one of ENERGIA's primary goals. Since 1995, ENERGIA has been active in linking individuals and organisations in Africa, Asia, Latin America, and Oceania, as well as in Europe, North America, and Australia. Ground-breaking papers and reports prepared by ENERGIA organisers and members have drawn global attention to the importance of considering gender issues in energy development plans and policies. ENERGIA News has also been an important vehicle for sharing insights and experiences from projects in various regions. This toolkit and resource guide represents an ongoing effort to bring together and present materials that deal with gender and energy issues and describe a variety of approaches to addressing those issues.

CAPABILITY DEVELOPMENT ON GENDER AND ENERGY

Because access to affordable and reliable energy services is essential for poverty alleviation and economic and social development, ENERGIA works to focus more attention on gender and energy linkages in the formulation of national energy plans and policies. The main objective of Phase 3 of ENERGIA's work is to strengthen ENERGIA members' capacity to integrate gender and energy concerns into the policies and programmes of government institutions, NGOs, knowledge institutions, multilateral and bilateral donors, and private companies engaged in sustainable development in the South and the North. More specifically, ENERGIA's programme will focus on enhancing the knowledge and skills of network members in the South.

DEVELOPMENT OF GENDER AND ENERGY KNOWLEDGE RESOURCES AND TOOLS

Involvement in the preparation of this toolkit and resource guide represents part of ENERGIA's work in developing knowledge resources on gender and energy; it builds on the Network's earlier activities, which focused on disseminating information to Network members, target groups, and other interested parties. ENERGIA has already supported a number of activities designed to raise the awareness of policymakers and planners in the energy sector, and is committed to building up a body of evidence and case studies linking gender sensitivity in energy policy and projects with equitable, efficient, and sustainable development outcomes.

In Costa Rica, the Sol de Vida Foundation has established a research center to promote the different uses of solar energy. Solar creativity workshops have been organized so that families can sample food made in solar kitchens, exchange recipes, learn about technical issues such as photovoltaic cells and drip irrigation, and even introduce their children to solar powered toys. (Photo: UNDP/Costa Rica)

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INTRODUCTION TO GENDER AND ENERGY

2.1 WHAT ARE THE LINKAGES BETWEEN GENDER AND ENERGY?[1]

The 1992 UN Conference on Environment and Development (UNCED), also called the Earth Summit, led to international consensus on the need for sustainable development that balances economic growth with concerns for social equity and environmental protection. Extension of the benefits of development to all people, men and women, is fundamental to the fulfilment of the social equity objectives of sustainable development.

In 1995, the UN's Fourth World Conference on Women, held in Beijing, concluded that throughout the world women continue to have fewer options and opportunities than men. Unequal treatment of men and women, and their differentiated social and economic roles, has also led in many countries to higher levels of poverty for women than for men.

Achieving gender equity is an important reason for attention to women's needs. Improving the effectiveness of poverty alleviation programs is another relevant consideration. The Millennium Development Goals adopted by the UN General Assembly include a target of reducing by half the number of people living in poverty by 2015. Access to affordable energy services is an essential prerequisite to achieving economic growth and poverty reduction. In order to achieve the global poverty reduction target, the distinct energy concerns of women need to be addressed through gender sensitive policies and programmes.

Approximately 2 billion people throughout the world do not have electricity. About the same number rely on traditional fuels, such as wood, charcoal, dung, and agricultural residues, for cooking and heating. Grid-based electrical power does not reach many rural and poor urban areas in developing countries, nor is there adequate distribution of gas or other cooking and heating fuels.

Increased access to electricity is needed, through extension of power grids as well as installation of decentralised small-scale energy systems powered by diesel fuel or by renewable technologies using solar, micro-hydro, wind, or biomass resources. Distribution and marketing of energy-efficient end-use technologies is also important for reducing overall fuel and electricity requirements. In addition, wider availability of liquefied petroleum gas (LPG) and other cleaner fuels is needed to provide affordable alternatives to traditional biomass-based cooking and heating fuels.

In order to lift the income levels of poor families and communities, energy policies and projects must be targeted to reach those who are most in need. In many contexts, it is women who suffer the most from conditions of extreme poverty. Of the 1.2 billion people living on the equivalent of one dollar a day, 70 percent are women. Because of their traditional responsibilities for collecting fuel and water, in many developing countries women and girls would benefit the most from access to improved energy services.

1 Adapted from Gail Karlsson and Susan McDade, "Introduction," *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001). Available on line at www.undp.org/energy/publications/2001/2001a.htm.

The time and physical effort expended by women and girls in gathering fuel and carrying water seriously limits their ability to engage in educational and income-generating activities. Literacy rates and school enrolment levels are dramatically different for men and women in many developing countries. Much of women's time is taken up with difficult and time-consuming chores related to producing and processing food without mechanical or electrical equipment and to cooking without clean-burning fuels and energy-efficient appliances.

Many women and girls also suffer from health problems related to gathering and using traditional fuels. In addition to the time and physical burdens involved in gathering fuel, women suffer serious long-term physical damage from strenuous work without sufficient recuperation time. Women must worry about falls, threats of assault, and snake bites during fuel gathering. They are also exposed to a variety of health hazards from cooking over poorly ventilated indoor fires, including respiratory infections, cancers, and eye diseases. Smoke from poorly ventilated indoor fires accounts for close to 2 million premature deaths per year.

Reduced drudgery for women and increased access to non-polluting power for lighting, cooking, and other household and productive purposes can have dramatic effects on women's levels of empowerment, education, literacy, nutrition, health, economic opportunities, and involvement in community activities. These improvements in women's lives can, in turn, have significant beneficial consequences for their families and communities.

Further Reading

The Gender-Energy-Poverty Nexus: Can We Find the Energy to Address Gender Concerns in Development?, by Joy S. Clancy, Margaret Skutsch, and Simon Batchelor (2003). Available on line at http://www.sparknet.info/uploads/file/gender-energy-poverty.pdf. Paper commissioned by the United Kingdom's Department for International Development (DFID) to explore current thinking on the gender-energy-poverty nexus, in particular to review the key issues and highlight areas that need to be addressed, and to suggest actions and further studies that need to be undertaken in order to "find the energy to address gender concerns."

"Gender and Health Issues in the Biomass Energy Cycle: Impediments to Sustainable Development," by Anoja Wickramasinghe, in *Energy for Sustainable Developmen*t VII, No.3 (September 2003). Available on line at http://www.ieiglobal.org/esd.html. Sri Lanka relies heavily on women's labour for energy generation in the domestic sector, using biomass resources, which leads to serious impacts on women's health. Data for this report were gathered through a questionnaire-based survey of households in Sri Lanka and field discussions, observations, and ethnological records.

"Gender and Household Energy: The International Context," by Joy S. Clancy (2003). Available on line at http://www.sparknet.info/goto.php/view/7/theme.htm. This briefing paper examines the linkages are between gender, household energy, and moving people out poverty. The first section looks at the gender-energy-poverty nexus in general and then how household energy can contribute to reducing vulnerability and empowering women.

Women are the specific focus since they generally have the responsibility for providing household energy. The section finishes with a review of how international development agencies address gender and household energy issues. The second section discusses privatisation of the energy sector and the impacts of fossil fuel combustion, in relation to gender and household energy. The paper is aimed at researchers and practitioners in the energy sector, as well as those involved in social development.

"Mainstreaming Gender in Energy Planning and Policies: UNESCAP Project on Capacity Building on Integration of Energy and Rural Development Planning." Draft background paper prepared for the Expert Group Meeting hosted by UNESCAP/UNDP. Available on line at http://www.energia.org/pubs/papers/dutta_egmbckgr.pdf. The paper begins by addressing the question "Why gender in energy?" It points out that gender differences and inequalities have consequences for energy needs, uses, and priorities. As a result, women are more affected by limited access to energy, especially in rural areas. The paper also looks at gender in traditional energy policy, noting that women's energy needs have been left out because they do not fit into the traditional energy paradigm.

2.2 WHAT ARE THE ENERGY NEEDS OF WOMEN IN DEVELOPING COUNTRIES?[2]

Energy policies relating to fuel choices, electricity generating capacity, and energy delivery systems have impacts on development that are not generally analysed in all of their social and economic dimensions. Although decision makers may view their energy-related choices as gender neutral, men and women are affected differently by energy policies wherever their home, work, and community roles differ. While small amounts of electricity at home in the evening hours may improve the quality of life for some members of the family, including through illumination for reading, and entertainment and communication through radios and televisions, for other members of the family it may simply extend the working day. In the former case it is men, and to some extent children, who benefit most, while in the latter case it is women who usually bear the burden. In many cases, the provision of electricity without attention to the provision of modern cooking fuels or appliances has resulted in rural electrification that in fact increases the hardships of women because the working day is prolonged while traditional fuel use patterns remain in place; solar home systems cannot supply the energy for cooking. Attention to these sorts of differing interests is needed in order to achieve effective and equitable distribution of energy services.

2 Adapted from Gail Karlsson and Susan McDade, "Introduction," and Salome Misana, "Overview," in *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001), www.undp.org/energy/publications/2001/2001a.htm, with information added from International Forum for Rural Transport and Development Web site, http://ifrtd.gn.apc.org.

TABLE 2.1 ENERGY MEETS WOMEN'S PRACTICAL, PRODUCTIVE, AND STRATEGIC NEEDS: SELECTED EXAMPLES

Energy Form	Women's Needs and Issues		
	Practical Needs	**Productive Needs**	**Strategic Issues**
Electricity	■ pumping water supplies – reducing need to haul and carry ■ mills for grinding ■ lighting improves working conditions at home	■ increase possibility of activities during evening hours ■ provide refrigeration for food production and sale ■ power for specialised enterprises such as hairdressing and Internet cafes	■ make streets safer allowing participation in other activities (e.g., evening classes and women's group meetings) ■ opening horizons through radio, TV, and Internet
Improved biomass (supply and conversion technology)	■ improved health through better stoves ■ less time and effort in gathering and carrying firewood	■ more time for productive activities ■ lower cost for process heat for income-generating activities	■ control of natural forests in community forestry management frameworks
Mechanical	■ milling and grinding ■ transport and portering of water and crops	■ increases variety of enterprises	■ transport allowing access to commercial and social/political opportunities

Source: Clancy, Skutsch, and Batchelor (2003).

As a starting point for gender-sensitive energy planning, it is important to identify the energy services of primary importance to women and to consider options for providing those services. Energy planning is often focused on increasing supplies of fuel or electricity, especially for industrial and urban uses, with little attention to the energy demand characteristics of women, especially those in underserved rural areas. Rural energy needs for domestic, agricultural, and small-scale informal production activities, where women predominate, are given low priority.

Approaches that favour demand-side considerations rather than supply-side energy targets are more likely to positively reflect women's actual needs. Overall, in order to reach the MDGs, energy should be considered within the context of community life, and energy policies and projects should be integrated in a holistic way with other programmes related to health, education, agriculture, and job creation.

FUELS FOR HOUSEHOLD USE IN TRADITIONAL ACTIVITIES

Affordable access to modern fuels is needed to address cooking, heating, and food processing needs, and to reduce reliance on fuelwood and traditional uses of biomass materials. Inadequate access to cleaner fuels, and the high costs of related appliances technologies, have proven to be barriers preventing women from moving up the energy ladder away from traditional fuels towards cleaner, more efficient fuels.

Lack of access to cleaner and more convenient fuels (such as LPG) dramatically increases the burdens on women as they carry out traditional household tasks, as well as income-generating activities. In many areas fuels other than wood and other forms of biomass are not available and actions are needed to promote better distribution systems and smaller gas-canister sizes that are more convenient for women to carry. Refill costs can also act as a significant barrier to continued usage.

Women's income-generating activities also often involve fuel-intensive activities requiring thermal energy. Examples include beer brewing, food processing, and kiln-based activities (see Table 2.3). Moreover, many of women's income-generating activities are actually carried out in the household and so a more holistic approach to household energy, which addresses both practical and productive energy needs, is required.

MECHANISED EQUIPMENT

Electricity and mechanical power are needed for preparing foods, grinding grain, pumping water, and running equipment for household and community use as well as commercial activities. Decentralised rural electricity systems are essential for relieving the burdens of drudgery and expanding economic opportunities in rural areas, where women's opportunities are most limited. Decentralised power can be obtained from conventional energy sources such as diesel generators; village or household systems using renewable energy sources such as wind, micro-hydro, and photovoltaics; or modernised biomass technologies. When electricity is used to support activities that generate revenue streams, women and their families can earn more income and can therefore afford to pay for the equipment, and for the electricity to run it.

LIGHTING

In areas without electrical power, adequate lighting is a critical need. Since illumination does not require a great deal of electrical power, better lighting can be provided through low-cost lighting options using battery power, small stand-alone home systems, or decentralised village power systems. Kerosene pricing policies also affect illumination opportunities for women.

Lighting is of particular significance for women. Global evidence has shown that the availability of lighting in the home increases women's literacy and educational levels, and extends the working day of women for income-generating activities. Lighting in public places also increases the safety of communities, particularly for women, and allows women greater access to public gatherings. Street lighting also opens up opportunities for extended trading hours by street vendors, an income-generating activity favoured by women.

BOX 2.1 WOMEN IN BANGLADESH MAKE BATTERY-POWERED LAMPS

A project funded by the World Bank Energy Sector Management Programme (ESMAP) has been running on the remote island of Char Montaz in the south of Bangladesh since 1999 and aims to improve the lighting and indoor air quality of rural households by replacing the traditional kerosene lamps with modern fluorescent battery-powered lamps. The fluorescent lamps are produced and marketed by a women's micro-enterprise and, so far, about one thousand households are using these lamps. The long-term potential is good with a market of 20,000 households in an area where grid extension within the next 20 years is highly unlikely.

The lamp business represents an important opportunity for the women to earn a relatively good wage. If a woman constructs and sells two lamps a day she earns the wages equivalent to a skilled labourer, a significant opportunity which both benefits her family and improves her social status.

The remote community also benefits from the lamps, which are highly efficient and have low energy consumption. The advantage over kerosene lamps is the reduced risk of fire, as well as the elimination of smoke and other emissions with their negative health impacts.

From the start, the project recognised the importance of rural women's knowledge about local conditions and used major inputs by these women in the design of the energy service mechanisms. Recognising that women had gaps in their knowledge of electronic components, and a lack of skills with the tools needed to work with the components, the project gave appropriate training to ensure that reliable lamps were produced. Training was also given in accounting and book-keeping. Male family members have also been encouraged to act as advisers to the women, especially on marketing, sales, and operating battery-charging services, a new activity that has developed out of the original project.

The indicators of project success include taking gender issues into account; using women's existing knowledge in the project design; providing compensatory training for gaps in technical and business knowledge; gaining male family members' support; providing income-generating opportunities; and providing a service the community wants. *Source: Khan (2001).*

BOX 2.2 PV PUMP PROJECT IN BRAZIL RELIEVES WOMEN'S DRUDGERY

A photo voltaic (PV) pump project was implemented in the Mamiraua Sustainable Development Reserve in Brazil by the Institute for Sustainable Development and Winrock International Brazil. The population of the area are small-scale farmers who are severely affected by variations in water level. A total of five PV-powered water pumps were installed, taking into consideration the local conditions. During three months of the year, the so-called dry season, primarily women and children have to walk for hours to fetch water and carry it in buckets or on their heads. The PV systems pump the water to a high reservoir from where it is distributed by gravity to the households. Not only have the pumps reduced the drudgery of the women, they have also contributed to increased economic activity, better health, and improved living conditions. *Source: Adelia de Melo Branco (2002).*

WATER PUMPING

In rural areas, women are often responsible for managing water for domestic consumption.

Where there are no water pumps, it is generally women who are tasked with hauling water for household needs. Besides creating additional burdens on women's time and strength, water scarcity limits agricultural productivity, decreases family sanitation, and reduces women's ability to prepare cooked food. Mechanical or electrified water pumping relieves women's burdens and makes basic household sanitation and subsistence activities much healthier and less time-consuming. In remote areas, solar, micro-hydro, and wind-powered equipment can be used to pump water and also provide electricity. These technologies can be combined with diesel generators to form hybrid systems.

BOX 2.3 WOMEN IN KENYA USE DONKEYS TO LIGHTEN THEIR LOAD, INCREASE INCOME

In western Kenya, a collaborative project between IT Kenya and a local NGO, Future Forest, used an existing revolving savings and loan scheme to enable a women's group to acquire donkeys. Women grouped together in threes to save half the cost of a donkey, with the balance provided on credit. The donkeys were mainly used for collecting water (twice as much as before) and for transporting soda ash, sand, and grains. The women are able to generate income for loan repayment by hiring out the donkeys to others and by trading transported goods (such as soda ash). Although women still spend a similar amount of time on transport, their personal energy expenditure and drudgery has been reduced and their income and economic security has increased. *Source: Fernando and Keter (1996).*

TRANSPORTATION

In regions where women and girls are the ones gathering fuel and water, lack of access to transportation services raises significant gender-related concerns, especially as nearby fuel and water resources become depleted or degraded. In many rural areas, there is no alternative to walking, and women rarely have access to vehicles to carry their loads. The work of transporting heavy loads injures and wears out women's bodies. Moreover, the time consumed in transportation activities restricts their ability to engage in commercial agriculture or other economic enterprises, as well as the time available for taking care of their families and themselves. In urban areas, more women use public transport, and loss of fuel subsidies to this sector mean that women can suffer more than men in the costs of travel to work.

BOX 2.4 TIME AND ENERGY TO PERFORM BASIC HOUSEHOLD CHORES: EASTERN ZIMBABWE

A study by Mehretu and Mutambira (1992) measured the time and energy used by different family members in transport connected with regular household activities. Chiduku Communal Area in eastern Zimbabwe is a resource-deficient area with a high population density. There is no electricity, and kerosene, which is used only for lighting, is very expensive. Seven routine trip-generating household activities were considered:

- Fetching water for domestic consumption (represented as Water in the table)
- Doing the family laundry (Laundry in the table)
- Collecting firewood (Firewood in the table)
- Grazing livestock (Livestock G in the table)
- Providing water for livestock (Livestock W in the table)
- Visits to local markets (Markets L in the table)
- Visits to regional markets (Markets R in the table)

Activity	Total week's household time (hours)	Female share of time (hours)	Female contribution (%)	Energy cost (calories)
Water	10.3	9.3	91	2,495
Laundry	1.3	1.1	89	304
Firewood	4.5	4.1	91	1,068
Livestock G	7.7	3.0	39	1,672
Livestock W	6.9	2.3	39	1,484
Markets L	15.0	9.5	63	3,585
Markets R	0.3	0.2	61	76

INFORMATION AND COMMUNICATIONS

Electricity is essential for radios, televisions, and other electronic equipment used for information and communications. Women who are restricted in their ability to leave the home or participate in public affairs may rely more heavily than men on radios (or televisions, if available) for news, information, and entertainment. Radios can be operated with very little electricity and can be effective tools for information sharing, training, marketing, and public awareness programmes. Rural telephones can be effective in enabling women to maintain contact with family members working away from home. Telephones also facilitate business opportunities. Indeed, running telephone services can provide rural women with a business opportunity.

Further Reading

"Enabling Equitable Access to Rural Electrification: Current Thinking and Major Activities in Energy, Poverty and Gender," by Elizabeth Cecelski (2002). Update of a briefing paper prepared for a brainstorming meeting on Asia Alternative Energy Policy and Project Development Support with emphasis on poverty alleviation and women. Available on line at http://www.energia.org/pubs/papers/2002update_cecelskiastae.pdf. Gender and poverty challenges in widening access to electricity in rural areas are arising in the context of renewed interest in rural electrification, especially using renewable energy, as a tool both for sustainable energy development and for greater equity in rural areas. Poverty reduction and gender equity are now integral goals for all major development institutions. Energy assistance programmes are seeking models and approaches to respond to these mandates. This paper reviews current thinking on energy, poverty, and gender, with a focus on rural electrification and renewable energy, as an initial attempt to conceptualise linkages and needs in this area.

"Gender Equity and Renewable Energies," by Joy Clancy, Sheila Oparaocha, and Ulrike Roehr (2004). Thematic Background Paper written for the Renewables 2004 Conference in Bonn, Germany. Available on line at www.renewables2004.de/pdf/tbp/TBP12-gender.pdf. This paper reviews existing evidence on the role of renewable energies in bringing gender equity. It first explores the evolution of thinking on gender and energy, in particular that practitioners no longer specifically focus on women and stoves (often referred to as "household energy"). Next, it offers reasons why gender analysis can help those people trying to increase the dissemination of renewable energy technologies. It describes briefly the gender aspects of household energy and how various renewable energy technologies can contribute to drudgery reduction and time saving, particularly for women. The available data are primarily in the form of case studies related to stoves programmes and rural electricity grid extension.

Blowing the Smoke Out of the Kitchen: Gender Issues in Household Energy, by Joy Clancy (2003). Briefing paper available on line at http://www.sparknet.info/goto.php/view/2/theme.html. This article looks at the issues relating to household energy and indicates that the way to more sustainable energy interventions involves applying a broader definition of household energy. This definition recognises the central role of the stove in the household, while at the same time recognising that household energy is part of an energy chain in which men and women play different roles. This chain allows household energy to be used as an entry point for rural development in general and women's development in particular. Addressing household energy issues offers opportunities for time and labour saving, income generation, health improvements, and social empowerment. Equipment and household, in particular the kitchen, design are important but neglected issues influencing energy use and women's work efficiency and health.

"Women, Transport Energy and Donkeys: Some Implications for Development Workers," by Paul Starkey and Priyanthi Fernando, in *ENERGIA News* 2, Issue 3, August 1998. Available on line at http://www.energia.org/resources/newsletter/enarchive.html. Programmes promoting rural development often fail to recognise the extent to which the transport burden consumes women's energy. Interventions to mitigate the burden should be based on participatory rural appraisal, and use technologies, credit schemes, and training programmes that suit the needs of women. Women's burdens can be reduced by the use of animal energy, but women's access to donkey power and equipment may be limited by lack of knowledge, inappropriate technologies, or women's lack of assets and purchasing power.

"Making a World of Difference in the Homes of a Few," by Anita Khuller, *ENERGIA News* 5, Issue 2. Available on line at http://www.energia.org/resources/newsletter/enarchive.html. This article describes the initiative taken by a charitable society to provide lighting to each house in the tribal village of Pavur, Kerala, India. Basket making is a major income-earning activity of the women, who are in many cases the breadwinners of the families. Having to gather the wild creepers for the baskets from the forests all day, the women do not have sufficient daylight hours for weaving. Kerosene lamps do not provide adequate light for this activity. Through the setting up of a revolving fund – a solar basket fund – the society has helped families finance their PV systems, which have lit up the homes and improved the quality of life considerably.

Grameen Telecom's Village Phone Programme in Rural Bangladesh: A Multi-Media Case Study—Final Report, by Don Richardson, Ricardo Ramirez, and Moinul Haq of Telecommons Development Group, Canada, for Canadian International Development Agency (CIDA), 2000. Available on line at http://www.telecommons.com/villagephone/finalreport.pdf. This report is based on a study of a pilot programme to enable women members of the Grameen Bank's revolving credit scheme to retail cellular phone services in rural areas. Apart from providing an income-generating activity for women operators, the programme has given rural women access to telephones, thereby allowing them to maintain social and economic contacts.

2.3 HOW ARE GENDER AND ENERGY RELATED TO ACHIEVEMENT OF THE MILLENNIUM DEVELOPMENT GOALS?

The United Nations has identified specific indicators to measure progress towards each of the Millennium Development Goals. For instance, the first goal – eradicating extreme poverty and hunger – sets a target of cutting in half, by 2015, the proportion of people whose income is less than $1 per day; achievement of that goal can be determined directly by measuring the proportion of people with incomes below $1 per day. The second goal – achieving universal primary education – can be measured by indicators like enrolment rates of boys and girls in primary schools and the proportion of students who remain in school through grade five.

Progress towards achieving the Millennium Development Goal of promoting gender equality and empowering women cannot be so clearly determined. Changes in gender relations and the quality of life for women are complex, socially varied, and subjective. Nevertheless, specific measurable indicators have been identified for that goal, including:

- ratios of girls to boys in school,
- ratios of literacy among men and women,
- numbers of women employed outside the agricultural sector, and
- proportion of seats in national parliaments held by women.

Table 2.2 outlines the connections between various MDG targets and gender/energy concerns.

TABLE 2.2 MDGS: GOALS AND TARGETS RELATED TO ENERGY AND GENDER

Goal	Target	How energy contributes to achieving goals and targets	Gender perspective
Goal 1: Eradicate extreme poverty and hunger	Target 1: Reduce by half the proportion of people living on less than a dollar a day	■ More efficient fuels and fuel-efficient technologies reduce the time and share of household income spent on domestic energy needs for cooking, lighting, and heating (poor people pay proportionately more for energy). (Reddy, 2000) ■ Reliable and efficient energy can improve enterprise development. ■ Lighting permits income-generating activities beyond daylight hours. ■ Energy can be used to power labour-saving machinery and increase productivity of enterprises.	■ Women and girls are generally responsible for the provision of energy for household use, including gathering fuel or paying for energy for cooking, lighting, and heating. ■ When women's time and income is freed up from these activities, they can reallocate their time toward (1) tending to agricultural tasks and improving agricultural productivity and (2) developing micro-enterprises to build assets, increase income, and improve family well-being.
	Target 2: Reduce by half the proportion of people who suffer from hunger	■ Improved access to cooking fuels and energy-efficient technologies increases the availability of cooked foods (95% of staple foods need to be cooked before they can be eaten). ■ Pumped water for drinking, cooking needs, and irrigation systems deliver more water than can be carried. ■ Mechanical energy can be used to power labour-saving machinery and increase productivity along the food chain (for example, by processing agricultural outputs through milling and husking). ■ Improved access to efficient fuel and technologies reduces post harvest losses and water needs through better preservation (for example, drying and smoking).	■ Women are generally responsible for cooking and feeding their families and often for subsistence agriculture and food processing. ■ A well-developed agricultural sector helps to promote economic opportunities for women, allowing them to build assets, increase income, and improve family well-being.
Goal 2: Achieve universal primary education	Target 3: Ensure that all boys and girls complete a full course of primary schooling	■ Access to efficient fuels and technologies frees up the time of children, who are often pulled out of school to help with survival activities (fetching wood, collecting water, cooking inefficiently, crop processing by hand, manual farming work). ■ Energy can create a child-friendly environment (through access to clean water, sanitation, lighting and space heating/cooling). ■ Lighting in schools allows night classes.	■ Girls are more likely to be taken out of school to help with domestic and agricultural chores than boys. ■ Spending on schooling, especially for girls, increases with higher incomes for women. ■ Girls are more likely than boys to be affected by a lack of access to clean water and sanitation facilities, reducing school attendance.

Continued on next page

TABLE 2.2 continued

Goal 3: Promote gender equality and empower women	Target 4: Eliminate gender disparity in education	■ Electricity enables access to educational information and information communications. ■ Street lighting improves the safety of women and girls at night, allowing them to attend night schools and participate in community activities.	■ Women are more likely than men to be illiterate. ■ Women are less likely than men to have access to information and be included in political and community life.
Goal 4: Reduce child mortality	Target 5: Reduce by two thirds the mortality rate among children under five	■ Cleaner fuels and technologies help reduce indoor air pollution, which contributes to respiratory infections that account for up to 20% of the 11 million deaths in children each year. ■ Traditional stoves can be unsafe (causing, for example, burns and household fires) ■ Cooked food, boiled water, and space heating contribute to improved nutrition and health.	■ Women have primary care for the health of children. ■ Women and young children spend the most time indoors. ■ Women and girls are generally responsible for cooking, often with unventilated open fires.
Goal 5: Improve maternal health	Target 6: Reduce by three quarters the maternal mortality ratio	■ Energy services can provide access to better medical facilities, including medicine refrigeration, equipment sterilisation, and operating theatres. ■ Energy can be used to produce and distribute information on sex education and contraceptives.	■ Excessive workload and heavy manual labour (for example, carrying heavy loads of fuelwood and water; arduous and repetitive agricultural and food processing tasks) may affect pregnant women's health and well-being.
Goal 7: Ensure environmental sustainability	Target 9: Reverse loss of environmental resources Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water	■ Over harvesting, land clearing, or environmental degradation can make fuelwood more scarce, forcing the poor to travel farther and spend more time and physical energy in search for fuel. ■ Availability of cleaner fuels and energy-efficient equipment reduces demand for fuelwood and charcoal, increases availability of dung and agri-cultural wastes for fertiliser, and reduces air pollution and greenhouse gas emissions. ■ Motorised pumps help provide more clean water for drinking and sanitation than can be carried by people or animals.	■ Women and girls are generally responsible for gathering fuelwood and collecting water. ■ The chances of sexual assault and other risks (for example, of snake bites) increases the further women and girls must travel.

Source: Ines Havet, "Linking Women and Energy at the Local Level to Global Goals and Targets," Energy for Sustainable Development *VII (September 2003). Available on line at http://www.ieiglobal.org/esd.html.*

Further Reading

Gender Mainstreaming in Poverty Eradication and the Millennium Development Goals: A Handbook for Policy-Makers and Other Stakeholders, by Naila Kabeer (2003). Available on line at http://web.idrc.ca/ev.php?URL_ID=33744&URL_DO=DO_TOPIC. This book brings together a diverse set of arguments, findings, and lessons from the development literature that help to explain why gender equality merits specific attention from policymakers, practitioners, researchers, and other stakeholders committed to the pursuit of pro-poor and human-centred development. It argues that improving women's access to economic opportunities and enhancing returns on their efforts, therefore, is central to achieving the goal of poverty eradication and the Millennium Development Goals.

Common Ground: Women's Access to Natural Resources and the United Nations Millennium Development Goals, Women's Environment and Development Organization (WEDO, 2004). Available on line at http://www.wedo.org/sus_dev/common1.htm#top. This booklet published by the Women's Environment and Development Organisation explores women's access to and control of natural resources as a critical factor in sustainable development. Through case studies on women's access to water, energy, land, and biodiversity, the booklet shows strong linkages between the MDGs on poverty eradication, gender equality and environmental sustainability.

2.4 WHAT LESSONS HAVE BEEN LEARNED ABOUT GENDER AND ENERGY FROM PROJECT LEVEL EXPERIENCES?[3]

EMPOWERMENT OF WOMEN THROUGH INVOLVEMENT IN PROJECT DESIGN AND IMPLEMENTATION ACTIVITIES

Women traditionally tend to have limited decision-making power about household purchases, including energy technologies. Since in many areas women are the primary users of energy equipment, it makes good sense for them to be involved in designing and implementing projects to meet their own energy needs. Women already have valuable knowledge about local conditions and resources. Additional education of women and women's organisations about energy options and technologies can increase their ability to contribute to energy solutions, including the adoption of new, cleaner fuels and equipment. Women who learn new skills and obtain improved access to energy for household and income-generating activities can create new resources for investing in better conditions for themselves, their families, and their communities.

3 Adapted from Salome Misana, "Overview," and Gail Karlsson and Susan McDade, "Introduction" in *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001). Available at www.undp.org/energy/publications/2001/2001a.htm.

BOX 2.5 WOMEN IN BULELAVATA DESIGN AND IMPLEMENT THEIR OWN MICRO-HYDRO SYSTEM

The women in Bulelavata, a small, remote village in the Western Solomon Islands accessible only by sea, used to live a subsistence lifestyle typical of women in tens of thousands of other villages across the Pacific Islands. Then, in 1998, the community chose to begin the process of establishing an energy-for-development project. In 2001, the community-owned micro-hydro system, funded by the Australian International Greenhouse Partnerships, Caritas, and the Provincial Government, was officially opened by the Provincial Premier. The system produces 24 kw and has 1.5 km of high voltage transmission line, enabling the community to sell power to the Provincial Secondary School.

For the women of Bulelavata, the energy project has had some significant and profound impacts, ranging from the practical, quantifiable advantages of lighting and community income to qualitative outcomes such as solidarity and empowerment. The project design of the Bulelavata community micro-hydro scheme used a women's participatory action agenda, exploiting "action learning" (or learning-by-doing). They had the decided advantage of a context where a relevant project was happening in their lives, one in which workshops could be grounded. The project included the following elements: policy support, female project management, female role modelling at varying levels, specific women's awareness and training workshops (although community workshops in which women participated were also held), visits by women to other villages, management committee positions for women, a new village institution for women, technical team leadership by women, and logistical project support teams being given equal status to technical project teams. This affirmative agenda was designed to encourage and facilitate active and meaningful opportunities for participation by the village women; it operated within existing Melanesian cultural and village religious mores while at the same time challenging the boundaries of perceived gender roles through the medium of the new technology.

The Bulelavata village men say that the electricity project has changed their women; they are now more confident and outspoken and participate more in community development activities. The men think this is a good outcome in terms of the whole project; they rate it second only (by general consensus) to the community's understanding of "planning for tomorrow." *Source: Donnella Bryce and Chin Ching Soo (2004).*

SUPPORTIVE POLICY ENVIRONMENTS

In order to design and implement energy policies that directly support poverty reduction and sustainable development goals, continued efforts will be required by national and local government institutions to reflect and address the distinct energy needs and conditions faced by men and women. Energy policies in many developing countries often particularly neglect energy needs in rural areas that relate to domestic, agricultural, and small-scale, informal production activities, ones where women tend to predominate. Gender sensitivity in national energy policies is most likely to be advanced by more general government policies related to gender equity and the advancement of women. (See section 2.5, "What Can be Done to Create Gender-Sensitive Energy Policies?", for further discussion of this issue.)

BOX 2.6 IF IT'S ABOUT COOKING, THEN ASK THE WOMEN: BIOGAS PROJECT IN INDIA

In Fateh Singh ka Purwa (India), a community biogas plant was installed to provide cooking energy. Technologically this plant can be considered a success, but socially it is a failure. Male community leaders are not interested in energy for cooking – they would rather have energy to power irrigation pumps, chaff cutters, and milling machines. Women are extremely critical of the plant. They were not consulted when it was decided that the gas supply would be limited to two hours (8am-10am) in the morning when the women are in the fields – a fact completely ignored by the plant organisers. The gas therefore does not provide even 25 percent of the day's cooking energy and the women have to look for wood as substitute for the dung cakes, which are used for the biogas plant. *Source: Ministry of Non-Conventional Energy Sources (2001).*

NEEDS ASSESSMENTS

Energy needs should be considered within the overall context of community life, and energy projects should be integrated with other development efforts related to health, education, agriculture, and job creation. A well-formulated needs assessment undertaken prior to the project design stage can ensure that the approach is grounded in the specific reality of the people involved and take into account the differences between rural and urban groups, between rich and poor households, and between men and women.

PARTICIPATORY PROCESSES

The full participation of the intended beneficiaries, including women, is crucial in all aspects of energy project identification, design, financing, mobilisation, implementation, and evaluation. Those whose lives will be directly affected by project outcomes generally have the best understanding of local needs, resources, and dynamics. Getting all the stakeholders to be able to participate, however, may require special efforts, especially since women often are excluded from decision-making processes. Care should be taken to understand the specific responsibilities and constraints that keep women's voices from being heard and specific measures should be adopted to enable women to

BOX 2.7 INDIA: ENGAGING WITH WOMEN BRINGS SUCCESS TO STOVE PROJECT

In India, improved stoves have been disseminated by various government departments. A small NGO, TIDE (Technology Informatics Design Endeavour), assessed the use of these improved stoves in rural households and found widespread rejection of the stoves. Although several reasons accounted for women's refusal to use the stoves, an important one is inconsistency between the government's goals and women's needs. The government aimed to save fuel use through introduction of the improved stoves. Women wanted to improve their welfare by reducing the smoke. Unfortunately the stoves did not meet this requirement. A new strategy for dissemination of household stoves was needed. TIDE engaged rural women in dialogue about their needs and expectations regarding improved woodstoves, and developed a stove design that met women's needs and a stove dissemination strategy for rapid penetration of improved stoves without subsidy or government intervention, completely conceived and executed by women. *Source: Bhogle (2003).*

effectively contribute (for example, separate planning committees for women and men, thereby creating an environment where women feel free to speak up).

INCOME GENERATION

Women in developing countries generally cannot afford to pay for new equipment unless it somehow can be used to generate income. Therefore, projects to address women's energy needs must take into account the types of value-added productive activities typically undertaken by women. Since new energy services are so sorely needed to combat poverty and support economic development, there may be opportunities for local people, including women, to become involved in producing and distributing new energy technologies and services. These energy service companies (ESCOs) create win-win situations by enabling some community members to earn income for themselves while helping to expand economic opportunities for the whole community through more reliable energy supplies. Increased income for women tends to raise their social and political status, and transforms household dynamics as well.

Since women's enterprises are frequently located in the home, and in the diffuse and difficult-to-reach "informal sector," they tend to be overlooked by agencies. The types of enterprises women are traditionally involved in also tend to be energy-intensive, relying heavily on biomass fuels (see the section "Fuels for Household Use in Traditional Activities," p. 11).

MARKET ACCESS AND OPPORTUNITIES

Effective marketing strategies are needed to fulfil the revenue-creating possibilities of energy projects designed to support expanded production activities. The marketability of the products, in terms of quality, affordability and competing alternatives, should be carefully evaluated during the project design phase, and business training and market development approaches should be incorporated, wherever possible, in order to make the business activities viable over the long term.

BOX 2.8 UGANDA: SOLAR DRYERS HELP WOMEN MARKET THEIR PRODUCE

In Uganda, an FAO/UNDP post-harvest program recommended small-scale solar dryers for long-term storage and household consumption of fruit and vegetables. However, rural women's groups were more interested in solar dryers for income generation than for food security. Subsequently, the "Fruits of the Nile" company was formed in 1992 to link rural producers with the market for dried fruit in Europe. Within three years, more than 50 women's groups had taken up the solar drier technology, and in 1995, the company exported more than 50 tonnes of dried fruit. The original food security concerns are also being addressed: When they are not drying for profit, the women use the solar dryers to preserve vegetables and fruits for home storage and consumption. *Source: Okalebo and Hankins (1997) in "Why Women Adopt Solar Dryers,* ENERGIA News *3 (July 1997). Available on line at http://www.energia.org/resources/newsletter/enarchive.html.*

TABLE 2.3 SAMPLE OF ENERGY-INTENSIVE, SMALL-SCALE ENTERPRISES OPERATED BY WOMEN

Enterprise	Comments
Beer brewing	25% of fuelwood used in Ouagadougou; main source of income for 54% of women in surveyed Tanzanian village/ 1 kg wood/1 litre beer
Rice parboiling	15-20% of firewood in some districts of Bangladesh
Tortilla making	1 kg wood/0.4 kg tortillas
Bakeries	Wood is 25% of bread production costs in Kenya; 80% of those in Peru (0.8-1.5 kg wood / kg bread)
Shea butter production	60% of cash income for women
Fish smoking	40,000 tonnes wood per year in Mopti, Mali; 1.5-12 kg wood/kg smoked fish; fuel is 40% of processing costs
Palm oil processing	Extremely arduous, requiring lifting and moving heavy containers of liquid; 0.43 kg wood/l litre oil; 55% of income of female-headed households in Cameroon's study
Gari (cassava) processing	Women in 2 Nigerian districts each earned $171/year; 1kg wood/4 kg gari
Hotels, restaurants, guest houses, tea shops	816,865 tonnes of wood annually in Nepal
Food preparation and processing	13% of total household income in Nepal; 48% of mothers in Dangbe district in Ghana; 49% of women in one village in Burkina Faso
Pottery making	Men and women have distinctive roles in different processes
Soap making	Fuel is high percentage of production

UNDP, Sustainable Energy Strategies: Materials for Decision-Makers, pp.2-5, citing data from Biomass Energy Services and Technologies (BEST), 1988, and Gordon, 1986.

FINANCING AND CREDIT

Because of the relatively high up-front costs of even small-scale, decentralised energy-related equipment, credit mechanisms may be needed, where appropriate, to distribute the financial costs of improved energy services over extended time frames. Women often are restricted in their access to the credit facilities needed to enter into income-generating activities or to expand their existing business opportunities. Financial institutions and credit mechanisms should be encouraged to specifically target, or at least be accessible to, women and women's organisations. Reforms may also be needed to address women's legal status and other factors that lead to the exclusion of women as borrowers.

BOX 2.9 ENSIGN PROJECT FINANCES MICRO-ENTERPRISES

The ENSIGN project was implemented in eight countries in Asia in a UNDP-financed project led by the Asia-Pacific Development Centre. Energy-linked micro-enterprise portfolios were developed through micro-credit banks and institutions in each country. In urban areas, connecting to the grid and more-efficient appliances were the most important desires. In rural areas, however, renewable energy, coal briquettes, and diesel fuels were preferred. In both rural and urban contexts, process heat and motive power were more crucial to income-generation than lighting. The ENSIGN Revolving Fund provided 36 per cent of total loan funds, national financing institutions provided 50 per cent, and borrowers' equity provided 14 per cent. Interest rates were 15 to 20 per cent, somewhat below market rates, with repayment periods of two to six years. Both individuals and communities received financing, and the average increase in income was 124 per cent (higher for the community projects).

Many activities were financed, including garment making, embroidery, felt and leather goods manufacturing, copper welding, utensil manufacturing, baking, cold storage, rubber stamp making, beauty salons, grain grinding, threshing, fish drying and powdering, soybean processing, rice-husk cook stove, spice drying, beedi (flavoured handmade cigarettes) wrapping, cinnamon peeling, and rice processing.

Some lessons from the ENSIGN project:

- Although this was not planned, the vast majority of borrowers were women, who proved to be enterprising, innovative, and creditworthy. Significant benefits for women, in addition to income impacts, were time savings and enhanced self-confidence from improved ability to support household income and greater control over self-generated finances.
- There is a need to account for the transaction costs of intermediaries, and there is need for a "Business Facilitator," possibly an NGO, in future replication efforts.
- Borrowers for ENSIGN-type loans are not usually the poorest of the poor; however, such people are often employed as labourers in the pilot projects. *Source: Ramani (2002).*

It should be recognised that micro-credit programmes tend to lend only small amounts of cash for short periods. These amounts are unlikely to be sufficient for the purchase of many types of stand-alone energy technologies. (See section 2.6, "How Can Innovative Financing Schemes Expand Women's Access to Energy?", for further discussion of financing and credit issues.)

CAPACITY BUILDING AND TRAINING

Capacity building is needed to strengthen involvement of women at all levels of energy policymaking, planning, and project development. At the project level, capacity building can mean learning new skills and gaining confidence in defining community problems and designing appropriate solutions. Through implementation activities, it can also involve acquisition of technical skills, such as bookkeeping, marketing, managing a plant, or learning about new energy technologies and how to run them. In terms of policy changes, capacity building may mean promoting and facilitating the involvement of women's organisations in decision-making processes and expanding the development opportunities for their members. (See section 2.7, "Encouraging Women's Involvement in Energy Decision Making and Use of Energy Technologies: What Can Be Done?", for further discussion of this issue.)

TABLE 2.4 CAPACITY-BUILDING NEEDS FOR MAINSTREAMING GENDER IN ENERGY

Target Group	Capacity-Building Needs	Means
National policymakers	■ Sensitisation towards openness to try out new methods and tools ■ Willingness to make space and strengthen women staff in organisation's set up	■ Advocacy through sharp media and print messages ■ Well-structured and focused interaction with researchers and NGOs
Implementers of energy programmes	■ Sensitisation towards gender issues ■ Practical tools and techniques to incorporate women's role in planning	■ Field-level workshops in local language ■ Exchange visits and interaction with local organisations working on gender issues
Village communities	■ For men, sensitisation and assurance that women can meaningfully participate in programmes while respecting their traditionally accepted space and roles ■ Willingness to participate in social empowerment process of women	■ Exposure visits ■ Focus group discussions
NGOs	■ Tools and techniques to incorporate women's role in planning orientation towards new methodologies	■ Local-level workshops ■ Interaction with researchers and policymakers

BOX 2.10 TRAINING WOMEN IN PV OPERATION GIVES BETTER RESULTS

Fundación Solar, while operating a PV project in Guatemala, found that mostly men attended the training sessions on equipment maintenance, and those women who did attend merely stood by and watched while their husbands got involved in hands-on activities such as changing the batteries. As a consequence, when the PV system needed maintenance, such as topping up the batteries, and the men were not at home, the women did not have the skills or confidence to take the appropriate action, which had a negative influence on the long-term durability of the system. Fundación Solar noted much better overall system care (and hence project performance) when they took specific action to train the women in system maintenance. By training women at home, while the men of the household were out, the NGO created an environment in which the women were not afraid to make mistakes or to ask questions. *Source: Wides (1998), as quoted in Skutsch (1998).*

ENVIRONMENTAL SUSTAINABILITY

Given the linkages between environmental concerns and current approaches to energy production and consumption, it is important to seek sustainable energy solutions. Numerous energy strategies are available that are safer and more efficient at the local level but also have positive global impacts. Women's environmental priorities tend to be those with a direct link to health and poverty alleviation issues. Preservation of traditional communal rights to land also may be important for ensuring women's access to natural resources. In some areas, women's groups are at the forefront of environmental protection efforts in order to maintain resources for future generations. To support local sustainable development, energy projects designed to address environmental protection and natural resource conservation goals must also provide expanded economic opportunities and improved health and social conditions.

Further Reading

"Energy for Rural Women's Enterprises in Ghana," by Sabina Mensah, in *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001). Available on line at www.undp.org/energy/publications/2001/2001a.htm. The Gender Responsive Renewable Energy Systems Development and Application (GRESDA) project demonstrated selected marketable and appropriate renewable energy equipment and energy efficiency appliances that can be used to create sustainable rural industries. The project focused on food-related activities since the majority of rural women in West Africa are involved in agriculture, small and medium scale food processing, and trade in such commodities as palm oil, shea butter, cassava, millet, smoked fish, vegetables, and fruit juices. The project's objective is to contribute to women's economic empowerment and food security by introducing energy technologies and equipment that improve agricultural processing enterprises and reduce post-harvest losses. Consultations with women have provided important insights into the actual needs of rural women with regard to improving their occupational opportunities. Women have also been actively engaged in appraising equipment and adapting it to meet their needs.

"Photovoltaic Project for Rural Electrification in Uganda," by May Christian Sengendo, in *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001). Available on line at www.undp.org/energy/publications/2001/2001a.htm. The Uganda Photovoltaic Pilot Project for Rural Electrification (UPPPRE) was designed as a three-year pilot project to promote the use of solar photovoltaic technology in Uganda. The project aimed at overcoming the financial, social, and institutional barriers that hinder the widespread dissemination of this technology. The strategy was to establish viable financial and institutional mechanisms for offering solar photovoltaic systems on a commercial basis to households, businesses, and communities. During the implementation stage, special efforts were made to encourage women entrepreneurs to purchase solar systems by offering credit through a women's bank, with some limited success.

"Upesi Rural Stoves Project in Kenya," by Beatrice Khamati Njenga, in *Generating Opportunities: Case Studies on Energy and Women* (New York: UNDP, 2001). Available on line at www.undp.org/energy/publications/2001/2001a.htm. The Upesi Project was initiated in 1995 to promote the adoption of more efficient stoves in rural areas of western Kenya. Its goal was to improve the living and working conditions of women in rural households by enabling a significant and increasing number of women and their families to benefit from fuel-saving wood-burning stoves. By working with interested women's groups, and involving them in the design and field-testing of the stoves, the project was able to take advantage of women's knowledge and experience. Besides training women in stove production, distribution, and installation, the project focused on improving their marketing skills. The benefits to men and women in the project areas include improved health and time savings for users of the energy efficient stoves, as well as relief from the pressures caused by wood fuel shortage.

2.5 WHAT CAN BE DONE TO CREATE GENDER-SENSITIVE ENERGY POLICIES?[4]

BUILD AWARENESS OF DIFFERENT ENERGY NEEDS OF MEN AND WOMEN

For the most part, policymakers do not take into account the differences between men and women relating to distribution of, and power over, energy services. As a result, policies generally do not recognise that there is a gender bias in energy services, and women's energy needs tend to be marginalized in policy documents.

Energy planning that is implemented in a gender-neutral way misses important issues and inadvertently discriminates, usually against women. For example, a policy to promote the use of electricity by small enterprises may neglect the fact that many of women's income-generating activities use process heat (such as for food preparation and processing, beer brewing, and pottery making), for which electricity may not be the cheapest option. Policies to promote effective distribution networks for LPG would offer an energy form more compatible with the need for affordable access to process heat.

PROMOTE A GENDER-MAINSTREAMING APPROACH

An engendered energy policy would recognise that women and men have different energy needs due to their differing household roles, responses to crises, and coping mechanisms and would offer energy technologies and services that match those needs. Engendered policies can be reached through gender mainstreaming, an approach that ensures that the concerns and needs of both men and women are considered in all planning and policy-making and that all policymakers are aware of the needs of men and women in relation to their roles and responsibilities.

4 Adapted from Joy Clancy and Marielle Feenstra, *How to Engender Energy Policy,* University of Twente, The Netherlands. Available on line at http://www.generoyambiente.org/ES/articulos_estudios/docs/gender_energy.doc.

INCREASE WOMEN'S PARTICIPATION IN THE ENERGY SECTOR

An engendered energy policy involves more than the creation of a gender-sensitive set of energy-related goals. The actual process of policy formulation and implementation needs to be engendered. Energy institutions tend to be male-dominated, particularly in the professional posts; as a result, the issues identified and the solutions offered often have a male bias. Increased participation of women in the energy sector and improvement of their status relative to men can help to incorporate gender as an integral part of energy policies and practices, although it will not guarantee the adoption of gender-sensitive policy goals. Engagement of women's groups may be important for incorporating gender issues into energy policies. A shift towards a demand-side approach, which looks at energy as an aspect of the social and cultural setting, rather than the traditional supply-side approach which focuses primarily on technology solutions, would contribute to better addressing gender energy needs.

COLLECT AND USE DISAGGREGATED DATA

In each step of the policy process – defining the issues, examining policy alternatives, making policy choices, implementing policies, and evaluating results – policymakers should specifically address how their decisions will differentially affect various population subgroups. This requires use of data sets disaggregated by sex and other social and economic variables to determine who is using what forms of energy to do what.

It is important to assess the impact of interventions not only on women's time and work profile but also on their self-realization and control over resources. In many households, the division of labour within the family is such that all the visible activities that involve money transactions (physical flows) are taken care of by the men. Men even get involved with women's traditional area of energy when it has to be purchased, for example in the purchase of batteries for radios. Recreational equipment, such as TVs and radios, may be bought before labour-saving equipment for domestic chores. Hence, when overall family income increases, the impact of the increase in income influences women's lives last, if at all. There is also very little information on the impacts of renewable energy interventions on women's work, in part due to lack of disaggregated data. At times, savings in one area of drudgery can result in increased drudgery in another area.

Disaggregated data at the monitoring and evaluation stage can lead to further policy development or modifications. For example, monitoring of a policy intended to provide decentralised energy services for income generation might reveal that women's uptake is less than men's because women lack access to the capital and collateral (such as land title deeds) needed for business start-ups. New policies could be introduced to overcome these barriers. However, it is important to recognise that these new policies might have to be generated in other sectors than energy, which underlines the need for an integrated approach to addressing energy issues.

INTRODUCE GENDER BUDGETING

In principle, public expenditures on social services and infrastructure are allocated on a gender-neutral basis. In practice, however, men and women have different needs and they use and benefit from services differently; budget allocations may not reflect those differences. Budgetary allocations have the power to transform gender inequalities. One approach to ensuring that the needs of women as well as men are met is for government budgets to be gender disaggregated. Gender budgeting is a tool that can be used to break down and identify the differentiated impacts of public revenue allocations and expenditures as they affect men and women. Any analysis should look at inputs, outputs, and outcomes.

BOX 2.11 THE SOUTH AFRICAN WOMEN'S BUDGET INITIATIVE

The South African Women's Budget Initiative does not propose a separate budget for women. Rather the exercise examines the entire government budget in order to determine its differential impact on women and men, girls and boys. The Initiative argues that government should allocate resources in a way that takes account of differential burdens borne and advantages enjoyed by women and men and try to balance these.

The South African Women's Budget Initiative uses gender analysis to analyse the budget. There are a number of techniques which can be used: gender-disaggregated beneficiary assessment; gender-disaggregated public expenditure incidence analysis; gender-aware policy evaluations of public expenditure; gender-aware budget statement; gender-disaggregated analysis of interactions between financial and time budgets; and gender-aware medium term economic policy scenarios. In the energy sector, the Initiative has looked at the budgetary allocations of the Department of Minerals and Energy (DME) and at the governance of the sector. In relation to the latter, the Initiative has argued that women's needs will not be truly addressed unless women have a major contribution to the decision-making machinery of the sector. In 1995, an analysis of the gender composition of the Council of ESKOM (the state owned electricity utility) showed that 2 of 18 members were women.

In terms of the budget, the focus was on the Energy Management Programme (EMP) component, which determines policy formulation and implementation for the entire sector. The DEM recognises in its policy statements that "gender issues and the role of women in energy decisions" is one of the key issues facing the Department in achieving its objectives. Despite this statement and the existence of an active and vocal group of women researchers engaged in gender analysis of the household energy sector, only 2.7 percent of the EMP budget was allocated to projects related to gender or women. Between 1994 and 1997, research had been entirely confined to the household sector and there had been no projects in sub-sectors such as agriculture, transport, industry, and commerce. *Source: Debbie Budlender (ed.),* The Second Women's Budget *(Cape Town, South Africa: IDASA, 1997).*

Initially, gender budgeting was done by experts; more recently, a more participatory approach is being used in which communities are consulted. This approach helps to increase women's participation in a process they might initially find "too technical."

The United Nations Development Fund for Women (UNIFEM), the Commonwealth Secretariat, and Canada's International Development Research Centre (IDRC) have undertaken a collaborative effort, the Gender Responsive Budget Initiatives (GRBI), to support government and civil society in analysing national and/or local budgets from a gender perspective and applying this analysis to the formulation of gender responsive budgets.

DEFINE THE ELEMENTS OF GENDER-SENSITIVE ENERGY POLICIES

Like any sectoral policy, energy policy has a multidimensional character: it contains political, economic, environmental, and social elements. Each of these elements has a gender dimension.

The **political** aspect of energy policy relates to the way in which the use, production, provision, and distribution of energy services are organised. Through political processes, various competing and convergent societal interests can be reconciled, including those related to gender differences.

The **economic** aspect of energy policy involves the financial resources available for implementation. Financial provisions are needed to promote the implementation of gender-mainstreaming, and pricing mechanisms and financial instruments should be analysed for differential impacts on men and women.

The **environmental sustainability** aspect of energy policies needs to recognize that in many cases men and women are affected differently by health problems related to energy use and production. Energy policy can offer distinctive solutions based on men's and women's differing roles and experience.

Energy policy also has a **social** aspect, since availability of energy services is central to sustainable human development. Improved access to energy services can reduce inequalities between men and women, rich and poor, and other population groups. Energy services can also contribute to women's empowerment.

The four general aspects of energy policy listed above need to be correlated with three issues that lie at the heart of women's energy needs: availability, affordability, and safety. The multidimensional aspects of energy policy can be combined with gender issues in the form of a matrix. Although the specific content of the matrix will vary according to local circumstances, the matrix can be used as a model for how to incorporate gender issues into the content of energy policy (Table 2.5).

ADVOCATE FOR GENDER-SENSITIVITY IN ENERGY POLICYMAKING PROCESSES

There are a number of different, sometimes overlapping, rationales for incorporating gender sensitivity into energy policies, and different stakeholders may be more or less responsive to different arguments and viewpoints. The primary rationales include:

TABLE 2.5 THE GENDER-AWARE ENERGY POLICY MATRIX

	Dimensions / Issues	Political	Economic	Environmental Sustainability	Social Equity and Empowerment
Access	**Availability**	Instruments to provide wide choice of energy forms for household and informal sector (e.g., biomass and LPG are part of supply mix)	Mechanisms to stimulate suppliers to enter the market supplying household energy (e.g., women are trained and supported to establish their own ESCOs)	Promotion of clean energy sources and technologies (e.g., incentives for developing household energy supplies around modern biomass forms)	Equal distribution and access to energy services (e.g., women are involved at senior level in energy-sector decision making)
	Affordability	Mechanisms to reflect women's incomes and cash flows in the cost of fuels (e.g., requirement for LPG suppliers to provide different size cylinders)	Pricing policy reflects women's incomes and cash flows (e.g., in electricity connection tariffs and payment methods)	Mechanisms stimulate switch to renewable energy sources and technologies (e.g., women have access to credit sources sufficient to purchase solar home systems)	Increased purchase power through reduced energy bills for households and informal/small businesses
	Safety	Safety regulations apply to household labour-saving equipment	Pricing policies and tariffs encourage switch to safer fuels and technologies (e.g., from kerosene to LPG or biogas for cooking)	Promotion of non-polluting technologies (e.g., information campaigns about the benefits of smokeless biomass stoves or solar cookers)	Promotion of increased well-being and personal safety (e.g., through street lighting enabling women to participate in events after dark)

Welfare: Lightening women's daily burdens, for example, by introducing more fuel efficient stoves to reduce time spent in wood collection (without trying to change their social roles or opening new doors for their advancement).

Efficiency: Increasing the effectiveness of energy activities and interventions by taking into account the different needs, constraints, and perspectives of men and women as prospective beneficiaries.

Empowerment: Aiming to transform women's lives by promoting greater self-reliance based on increased skills, income, social status, and decision-making power and enabling women to take control of their own transformation process.

Equality/equity: Working towards a fairer distribution of rights, power, and money between men and women in a society.

Poverty alleviation: Since so many of the world's poorest people are women, addressing extreme poverty and hunger through energy policies and programmes that take into account the particular needs and constraints of women.

Further Reading

From Rio to Beijing: Engendering the Energy Debate, by Elizabeth Cecelski, in *Energy Policy* 23, No. 6 (June 1995), pp. 561-575. New perspectives in the energy sector and new approaches to gender issues are especially conducive to reopening the debate on the role of women in energy policy and research. The author suggests that mutual concerns in energy forums and gender circles, jointly addressed, could further both the Rio energy programme goal of sustainable development (an outcome of UNCED in 1992) and the Beijing Women's Platform for Action (coming out of the Fourth Conference on Women in Beijing in 1995). While not exhaustive, specific issues in need of gender research are highlighted among areas of current and future energy policy concern: demand analysis and management, promoting the transition to more efficient fuels and technologies, energy efficiency, renewable energy technologies, and sustainable transport systems.

"Gender Issues in Energy Policy," by Jyoti Parikh, in *Energy Policy* 23, No. 9 (1995), pp.745 -754. Gender issues have received attention at the micro-level in terms of technological interventions such as cook stoves, biogas, solar cookers, and wood plantations. They have yet to be addressed in macro-level policies. Women's needs for energy vary, depending on whether they are in urban or in rural areas, their stage of economic development, and whether they are economically active. This article emphasises the need for a better understanding of these issues for women engaged in different sectors, including agriculture, transport, industries, household, and the energy sector itself. Deeper investigations, analyses, and action for gender issues are needed through surveys, laboratory experiments, macro-policy modelling and analysis, and technology development and production. This article makes a plea to include gender issues in macro-level energy policies in such areas as energy investment, imports, and pricing.

"Durban Declaration," Women in Energy Ministerial Meeting, 11-12 December 2000, Durban South Africa. Available on line at http://www.villagepower2000.org/news/article.asp?id=1440. This declaration was made by the African Ministers responsible for the development and utilisation of energy, in partnership with representatives of international organizations, NGOs, and the private sector, at the Women in Energy Ministerial Meeting, part of the Second Africa US Ministerial Conference to discuss and explore possible policy, financial, and economic solutions for problems experienced by African women with regard to the energy sector.

Engendering Energy Policy: A Case Study from Uganda and South Africa, by Marielle Feenstra (2002). Available on line at http://www.wougnet.org/Documents/gender_energy.pdf. This masters thesis looks at the process of engendering policy and aims to identify the elements of the framework needed to guide the process to a successful conclusion in the energy sector.

"The Road to Johannesburg and Beyond: Networking for Gender and Energy," by Gail Karlsson and Sheila Oparaocha, in *Energy for Sustainable Development* VII, No.3 (September 2003). Available on line at http://www.ieiglobal.org/esd.html. The Energy Decision adopted by the UN Commission on Sustainable Development in 2001 reflected a gender and energy perspective due to successful lobbying and advocacy activities by ENERGIA members in partnership with other organisations. However, the 2002 Plan of Implementation adopted at the World Summit on Sustainable Development did not similarly reflect the linkages between energy, poverty, and gender roles. The dynamics of international negotiations are complex, and more effective, broad-based advocacy techniques are needed.

"Gender Perspectives on Energy for CSD-9," by Elizabeth Cecelski, ENERGIA Consultative Group and CSD Women's Caucus position paper (2001). Available on line at http://www.energia.org/pubs/papers/csd9pospaper.pdf. This paper identifies successful examples of approaches to increasing women's access to sustainable energy in the South, as well as initiatives to increase women's energy expertise and information in the North, and makes recommendations for empowering women and engendering energy policies and programmes.

2.6 HOW CAN INNOVATIVE FINANCING SCHEMES EXPAND WOMEN'S ACCESS TO ENERGY?[5]

FINANCING MAY BE NEEDED FOR ACQUIRING ENERGY EQUIPMENT

Small-scale, decentralised energy-related technologies and appliances could help relieve women's daily burdens, especially in rural areas, and increase their economic and social opportunities, but one of the primary difficulties facing poor people is the lack of capital for acquiring these items. In some situations, equipment or capital grants have been provided by donors or through some combination of community participation, grants, and local government contributions. Recently micro-credit financing has emerged as a valuable tool for providing capital to poor people who were previously viewed as bad credit risks – especially poor women. Though there are limitations to the reach and effectiveness of micro-credit, in many cases it has been a useful approach, although the amounts available under this type of financing are often insufficient to purchase many small-scale energy technologies. So far, there has been only limited use of micro-credit schemes to finance energy-related technologies and equipment, but there is significant potential for small-scale lending to be adapted to meet women's needs for affordable access to energy.

5 Adapted from Gail Karlsson, *Micro-Credit and Financing Schemes to Expand Access to Energy for Poverty Alleviation and Empowerment of Women,* UNDP Briefing Paper (2003).

WOMEN FACE CONSTRAINTS IN GAINING ACCESS TO CREDIT

Most rural banks and lending institutions have conditions for lending, such as collateral and credit history requirements that exclude poorer borrowers. These requirements generally have a greater impact on women, who may face legal restrictions making it difficult for them to own land or other assets or to take action without their husbands' consent. They may also be discouraged from borrowing or engaging in business by social and cultural barriers limiting women's activities and mobility and by illiteracy, which is more prevalent among women due to less access to schooling.

MICRO-CREDIT PROGRAMMES CAN PROVIDE FINANCING AND EMPOWER WOMEN

Micro-credit programmes, many of them modelled after the Grameen Bank in Bangladesh, have been used to address some of the constraints keeping women from gaining access to credit by offering small amounts of short-term working capital, which must be repaid at frequent intervals. Since most women have no assets that can be used as collateral, repayment is assured through a system that links loans to the members of a small group, so that all the members are responsible for the repayment of each other's loans. Bank members are also usually required to keep a savings account. This system has resulted in very high loan repayment rates, encouraging expansion of the programmes. By establishing a credit history based on repayment of very small loans, women can graduate to bigger loans to build up their business activities.

Although concerns have been raised about whether women in fact retain control of the funds they borrow or whether their husbands end up using the funds (a concern that increases with the level of funding), there is evidence that many women have gained significant benefits from micro-credit programmes. The Grameen Bank in Bangladesh allows women who have successfully repaid three loans to graduate to larger loans for land purchases or home improvements, moving beyond the micro-level of borrowing. Since title to the property has to be in the name of the bank member, some women have actually been able to become legal owners of the family home.

VARIATIONS ON MICRO-CREDIT PROGRAMMES CAN HELP POOR WOMEN PURCHASE ENERGY-RELATED EQUIPMENT

Adaptations to micro-credit arrangements to provide access to capital for energy equipment would need to involve larger loan amounts and longer time frames for repayment. Borrowers would generally need to be able to generate income from using the equipment for business activities and use the additional income generated, in part, to pay off the loans. Most lenders, and borrowers, however, are not familiar with energy technologies and need some capacity building in order to handle loans for purchasing energy equipment. Village savings and credit institutions already used by local people could be encouraged to expand their operations to include energy lending. They are more accessible to women because they are close by and less formal than commercial banks.

The Grameen Bank recognised the importance of energy financing and organised a special non-profit affiliate, Grameen Shakti, to act as a supplier of energy technologies – primarily solar home systems. Unlike the Grameen Bank, the Grameen Shakti finance programme is not particularly targeted towards women, and the customers are generally the wealthier members of the community. However, promotion of the systems for income-generating purposes, and adaptation of a credit scheme to reduce the down-payment requirements and extend the payment periods, could expand the market for the systems, bringing down costs and making them more accessible to women bank members and less affluent borrowers.

ENSIGN, a project initiated in 1996 by the Asia-Pacific Development Centre and UNDP, was innovative in the way it coupled provision of energy services for the poor with promotion of income-generating activities financed by micro-credit. As it turned out, the majority of the borrowers were women who undertook a wide variety of productive enterprises.

With proper support and capacity building, community-based women's groups and development organisations can also introduce energy alternatives and help in arranging financing. These sorts of activities can be particularly effective for women's empowerment if they are combined with literacy and skills training, and business development assistance.

Collective mobilisation of resources can provide an alternative method of financing delivery of energy services, especially to rural areas unlikely to be connected to central power distribution systems. Renewable technologies such as wind and micro-hydro generators are generally too large for individuals to purchase by themselves, but may be affordable sources of electrical power for communities if they are purchased collectively, for example, the Mali multifunctional platform has shown such collective ownership of energy systems. Through savings programmes and credit arrangements, village banks, NGOs and micro-credit institutions can help mobilise the necessary funding.

Further Reading

"Energy as an Instrument of Women's Economic Empowerment," by K.V. Ramani, in *ENERGIA News* 5, Issue 1 (April 2002). Available on line at http://www.energia.org/resources/newsletter/enarchive.html. The author argues that wealth creation is the only way for the poor to escape their socio-economic deprivation and that access to energy is a means of wealth creation for women. Using the findings of the ENSIGN project, which was implemented in several Asian countries, he states that micro-financing is a key for women to get access to energy. Women borrowers in the ENSIGN project were enterprising, creative, and creditworthy, and the project generated many economic and social benefits. He emphasises the need for establishing and strengthening linkages between energy, gender, poverty eradication, and micro-finance in future actions.

"Uganda: Gender Responsive Planning for Access to Solar Technology Through Establishment of Appropriate Financing Mechanisms," by May Sengendo and G. Turyahikayo (2002). Case study for ENERGIA Regional Paper, *Gender and Sustainable Energy Issues in Africa: Perspectives for the World Summit on Sustainable Development*. Available on line at http://www.energia.org/pubs/papers/wssd_africa_regpaper.pdf.

Micro-finance institutions (MFIs) have a variety of strategies for addressing the barriers women face in borrowing from commercial financial institutions: targeting women with their credit programmes through consideration of women as a disadvantaged group; using alternative non-traditional security arrangements such as group guarantees to enhance women's access to financial services and overcome gender inequality in the ownership of assets (such as land, houses, and other fixed assets) for collateral security; and linking the financial services they offer to clients, which is more attractive to women. Financing for solar PV equipment is a new item for most financing institutions. The project learned from the initial implementation phase, working with micro-finance institutions, and changed to using intermediary entities, in particular village savings and credit institutions (called village banks) to administer solar PV loans.

2.7 ENCOURAGING WOMEN'S INVOLVEMENT IN ENERGY DECISION MAKING AND USE OF ENERGY TECHNOLOGIES: WHAT CAN BE DONE?[6]

Two regional workshops looked at the issue of women's education and training in relation to their involvement in energy decision making and their use of energy technologies. The Regional Workshop for Southern Africa, sponsored by the UNDP Energy and Women Project in June 1999, identified lack of education and technical training as an important constraint on women's participation in activities involving energy systems and entrepreneurial activities. Participants at the workshop recommended increased education of women and girls in science, engineering, and other technical studies, as well as training in leadership skills, as ways to increase their ability to participate in energy decision-making processes and to work in the energy sector. (See *Report on Regional Workshop for Southern Africa,* September 18, 1999). The Regional Workshop on Women and Sustainable Energy in Africa, sponsored jointly by ENERGIA, ELCI, UNIFEM, and Winrock International and held in Nairobi, Kenya, in March 2000, emphasised the need for technical training at all levels, especially for women, to increase local participation in technology design, production, and maintenance. (See *The Regional Workshop on Women and Sustainable Energy in Africa,* March 13-15, 2000, Nairobi, Kenya).

MAKE TECHNICAL TRAINING ACCESSIBLE TO WOMEN

Many people view operating machinery as men's work, not appropriate for women. Technical experts and educators may feel this way, as well as men and women in rural communities. In some areas, women are discouraged from running any kind of business and are expected to stay at home taking care of family responsibilities. In other areas, women engage in a variety of small income-producing enterprises in addition to maintaining their households, but larger businesses are managed primarily by men.

6 Adapted from Gail Karlsson, *Technical Training for Women Regarding Energy Technologies,* UNDP Briefing Paper (2003).

Although it is not a simple matter to overcome all these difficulties, there are some things that can be done to make training more accessible to women. Technical training programmes can be designed so that they are more sensitive to women's needs, offered at times and locations compatible with women's family roles, and adapted to women's levels of skills and confidence. Trainers can be coached on gender concerns, or selected for their support of women's enterprises and social advancement. Trainers also need to be sensitive to the fact that women often feel more comfortable in women-only environments when acquiring new technical skills. The timing and location of training courses must take into account women's time constraints and availability, as well as their more restricted mobility compared to men.

Because women are sometimes reluctant to work with machines, especially ones generating electricity, it may be better to train women separately from men in order to allow them to gain confidence and learn things for themselves. Technical training modules for women designed by Saskia Everts for TOOLConsult emphasise technological empowerment of women. Her teaching methods encourage women to learn through discovery, rather than waiting to be told how something works. For example, women learning about electricity are given batteries, wires, lamps, switches, and tools, together with a simple diagram, and are asked to figure out how to get the lamp to light up. The sense of accomplishment and confidence achieved when they are successful helps the women feel a bond with the equipment, rather than a psychological distance, and makes them more willing to work with equipment when technical problems arise. See Saskia Everts, *Gender and Technology: Empowering Women, Engendering Development* (New York: Zed Books, 1998).

SHARE INFORMATION ABOUT ENERGY-RELATED TECHNOLOGIES AND TECHNIQUES

Poor households, especially in rural areas, generally have little access to information about possible energy options and how to use them. Publicity and marketing campaigns must contend with low literacy rates, undeveloped market systems, and weak communications. Radio and television programming could be used to provide basic information in some areas, but this is an expensive way to reach people, so other ways of providing access to energy information need to be devised. Over time, access to computers and Internet connections in village schools and community facilities could bring large amounts of technical information into rural areas, but few people in remote communities currently have such access. Markets can also be useful contact points with women for disseminating information about and demonstrating new technologies.

Networking among community organisations and women's groups provides a relatively simple way of sharing information about rural energy alternatives, but one which requires widespread organisation and technical support. Various organisations have been working internationally, regionally, and within countries to promote networks through which people from different areas and countries can exchange their experiences with different energy technologies and approaches.

COMBINE LOCAL PRODUCTION OF ENERGY EQUIPMENT WITH MARKETING AND BUSINESS TRAINING

There is often a wide gap between the people who design and produce technologies and those who actually use them. Yet not all technologies involve complex machinery. Some can be made locally by women in rural areas, providing entrepreneurial opportunities as well as improved services. The combination of technical production skills with business management training can provide a powerful boost to women's incomes and status, if there is sufficient demand for the locally produced goods.

It is usually crucial that technical training be combined with learning the skills needed to run an enterprise – including business management, accounting, financial planning, and marketing. The same sort of social factors that keep women from learning technical skills may make it difficult for them to gain business skills, so special arrangements may be required to make sure that women get the support they need. In many cases, this will come from the formation of local women's associations or committees.

TRAIN MORE WOMEN TO BE INVOLVED IN THE ENERGY SECTOR

Throughout the world, men dominate the energy industry. Most managers as well as employees of electricity companies are male. Few women have access to the sort of education and support systems that would allow them to pursue careers in the energy sector. Moreover, even many well-educated women encounter obstacles deterring them from engaging in enterprises based on technical expertise.

BOX 2.12 KENYA AND MALAWI: TRAINING WOMEN TO PRODUCE ENERGY

In Kenya, the widespread adoption of fuel-efficient Upesi stoves was achieved by training local women in stove production, distribution, and installation. Many women became involved with the Upesi Rural Stoves Project because they had already acquired pottery skills in connection with their household activities. Besides learning how to produce the stoves, they also received training in costing and pricing, record keeping, forging marketing links, and responding to consumer demands. Because of the women's many domestic and community responsibilities, the training had to be fit into their other ongoing activities. Once trained, they spent two or three days a week working on the stoves. Some women producers went on to train others on a fee basis and others applied the skills they acquired to other business ventures.

In Malawi, the Ndirande Nkhuni Biomass Briquette Programme involved training women's groups to produce briquettes from waste materials for use and sale as an alternative fuel source. Women were involved with the design of the wooden briquette-making machines, which are inexpensive and easy to maintain. Spare parts are easy to get and local artisans have been trained by the project to make new machines when necessary. The training focused on women because they are the main users of household energy. The women's groups also received training in maintenance skills, entrepreneurship, and business management. As in the Kenya project, some women went on to train others for a fee. *Source: Kenya and Malawi case studies in* Generating Opportunities: Case Studies on Energy and Women *(New York: UNDP, 2001). Available on line at www.undp.org/energy/publications/2001/2001a.htm.*

Overall there is considerable need for more mainstream acceptance of women in technical roles. Gender-sensitivity training programmes for engineers, educators, scientists, government officials, and development agencies can highlight some of the constraints affecting women and promote greater attention to institutional prejudices and discriminatory practices. A gender mainstreaming exercise in the Rural Electrification Board (REB), Bangladesh, had the objectives of increasing women's participation in the REB and its programmes at all levels and supporting and encouraging the professional development of women in this area. In the long run, however, higher levels of education and technical training for girls are needed, especially in science and engineering, to allow more women to get involved in energy industries. Networking and advocacy by women's organisations represent important ways of promoting the acceptance of women as energy experts. In the Pakistan Oil and Gas Sector, the Canadian agency CIDA has supported the development of a network of women professionals to exchange experiences about overcoming the barriers they face in their working life. Unfortunately such initiatives are few and far between in the energy sector, while there are still significant obstacles to overcome.

At the project and community level, training programmes that draw women into energy enterprises can serve as starting points for bringing about the social and economic changes needed for girls and women to pursue higher levels of education and technical training. Sometimes the self-confidence fostered through project activities increases people's ability to make other changes in their lives.

Building confidence and knowledge about energy technologies is especially important for women and girls with low status and education who are burdened by lack of affordable energy options. It is also needed, however, at all levels of the energy sector so that more women can become energy experts and influence the design, operation, and marketing of energy-related products and services.

Further Reading

Electricity in Households and Micro-Enterprises, by Joy S. Clancy and Lucy Redeby, Energy and Environmental Technology Source Book published by Intermediate Technology Publications in association with UNIFEM (2000). This source book aims to provide practical help in gaining access to electricity for individual home owners, small businesses, and remote or rural communities. It gives an introduction to the national grid and then focuses on possibilities for independent production of electricity in the quantities used by households, micro-enterprises, and small communities. Various technologies are described, including costs and required inputs and skills for installation and operation. Case studies from developing countries highlight successful women's initiatives with these technologies.

"Rural Women as Agents of Improved Woodstove Dissemination: A Case-Study in Huluvangala Village, Karnataka, India," by S. Bhogle, in *Energy for Sustainable Development* VII, No. 3 (September 2003), pp. 70-75. Available on-line at http://www.ieiglobal.org/esd.html. This case study describes the coming together of two NGOs and a women's self-help group to provide income-generating opportunities for rural women as stove entrepreneurs.

Being aware that many rural women had rejected the stoves disseminated under the government programme, the NGOs realised the need for a new dissemination strategy. They engaged in a dialogue with the rural women on various aspects of stoves: design, performance, durability, efficiency, etc., so as to select a stove that would cater to their needs and expectations. A stove training programme was tailored to meet the site specific conditions, and women were trained in stove construction. Not only are the women using the stoves, they are selling their services to other women – and more women are using the improved stoves.

"Bulelevata Women Speak," by Donella Bryce and Chin Cing Soo, in *ENERGIA News* 6, Issue 2 (January 2002). Available on line at http://www.energia.org/resources/newsletter/enarchive.html. The women of Bulelevata village in Western Solomon Islands collect the communal proceeds from their electricity system. The experience of constructing a complex micro-hydro electric power system in Bulelavata village, and the flexible development tool that was created, provided both a hope for the future and the capacity to realise that hope. The women describe in their own words their experiences arising from their strong involvement in micro-hydro development.

"Gender and Equity in International Petroleum Projects: Women in the Oil and Gas Sector," by Dorothy Lele, in *ENERGIA News* 2, Issue 3 (May 1998). Available on line at http://www.energia.org/resources/newsletter/enarchive.html. Petroleum exploration and development is seen as men's work the world over. However, increasingly more and more women are entering the petroleum sector and challenging these assumptions. This article describes a CIDA Project in Pakistan and China, which attempts to support women in challenging those assumptions. The project works with staff at all levels, including gender sensitivity training for company executives and increasing technical skills for women. The project has found it most effective to combine gender equity initiatives with human resource development wherever possible. Media campaigns to increase women's visibility as valuable employees is seen as a good way to help change attitudes and encourage more women to join the industry.

"Participatory Learning and Action: A Trainer's Guide for the South Pacific" and **"Community Environment Workshop Handbook for Women"** (2000). Produced by the groups Ecowoman and Wainimate. The series of participatory learning activities in villages and the book and video were funded by CIDA through the Pacific People's Partnership in Canada, and the additional environment workbook was funded by AusAID. These publications bring together the activities and experiences the groups have had over the last three years in participatory learning and action. They can be obtained through ECOWOMAN; Box 16737, Suva, email: Ecowoman@is.com.fj.

In developing countries like Bolivia, women are particularly impacted by the lack of energy services. They spend long hours gathering wood and carrying heavy loads over long distances. (Photo: Liba Taylor/UNDP)

3

ENGENDERING PROJECT PLANNING

3.1 PROJECT PLANNING SITUATIONS

Embedding a gender approach while planning energy projects at community level can take place in two distinctly different situations. The ideal situation would be first to determine the priorities of the people (both men and women) themselves and then to focus the project, or multiple projects, on assisting them in improving their livelihoods and making them more sustainable. Commonly known as **integrated development,** this approach makes it possible to address a number of issues simultaneously, for example health and education; energy is an instrumental component rather than the focus.

Many projects, however, fall short of an integrated development approach. In the energy technology area, the many NGOs and private sector companies focus primarily on one type of technology, although many offer two or even three. In essence, they are driven by the fact that they are "selling" a limited range of energy options. This type of planning situation is identified as the **single energy technology situation.**

These two main planning situations are discussed in more detail below. It is assumed that both use the project cycle and that the integrated development situation uses a sustainable livelihoods (SL) framework. The SL approach integrates environmental, social, and economic issues into a holistic framework for analysis and programming from the beginning. By using both participatory and policy (cross-sectoral) tools, the SL approach highlights the inter-linkages between livelihood systems at the micro-level and the macro policies, for example the withdrawal of kerosene subsidies, that affect these livelihoods.

INTEGRATED DEVELOPMENT SITUATION

The integrated development situation concerns the type of project that is not primarily concerned with energy but with overall development within a community. Energy is just one of many issues to be addressed, and the project managers are usually not specialists in any particular sort of energy. The range of energy options that the project could consider may in theory be quite broad, since there is no vested interest in a particular technology. In practice, however, energy has hardly been included in most integrated development exercises, or has been marginalized in them. This is often due to lack of understanding of the importance of energy and/or lack of knowledge of the full range of options.

When a community has identified energy as a priority, an improved approach to planning might consider the whole range of energy-using activities carried out by the men and women who are the intended beneficiaries, and then consider which of these activities should get priority, before deciding what the technical possibilities are. Determining the priorities should be done by the community. Following the prioritisation, it might be necessary to look at the barriers to adoption of such technical possibilities, on a gendered basis.

A variation on this integrated development situation is the "women in development" approach, in which the project has women as the target group. The aim of this sort of project is generally to provide benefits specifically for women's development, and such projects are often empowerment-oriented. Questions then arise concerning the extent to which energy is a key to such development, the priority which women accord it, and what kinds of barriers may need to be overcome to solve the identified energy problems.

SINGLE ENERGY TECHNOLOGY SITUATION

As noted, the nature of institutions in the energy sector means that many projects in fact have a "single interest" character and are promoted and carried out by specialists in the particular technology. In this situation, projects focus on a particular type of energy technology: for example, solar applications, biogas, improved stoves, micro-hydro systems, or mini-grids.

However, it is important to note that different energy technologies may provide either a single energy service (e.g., improved stoves for cooking) or multiple possible services (e.g., community electricity systems using micro-hydro systems, mini-grids, etc.). In the latter case, it is essential to determine the priorities of both men and women to ensure that the intervention has a positive impact on people's livelihoods and also addresses the gender objectives of the project.

This **single energy technology situation** also includes interventions on the supply side, for example projects that are concerned with supporting community forest management for wood fuel supply or utilisation of agro-processing residues through briquetting.

3.2 PROJECT PLANNING FRAMEWORKS

In both the situations described above, it is not simply the question of choice of energy technology that is of concern (by which gender? for use of which gender?), but the choice of energy system as a whole – including the details of who is involved in implementation and how the energy technology is managed, maintained, and repaired, and the gender relations that are thereby implied.

For both the integrated development and the single energy technology situations described above, one can formulate a set of questions that must be answered to assure gender-sensitive energy project planning. These projects will also have gender goals (efficiency, equity, empowerment), which need to be explicit. Subsequently, these questions are linked to the different steps in the **general integrated planning framework of the project cycle.** The answer to a question can come from a desk exercise, a brief consultation with relevant stakeholders, or can be based on the outcome of a data analytic tool.

The gender data analysis and gathering tools are not "add-on" in nature; they are integrative. The tools should not be used **on top of** regular planning tools but rather should partly replace regular planning tools, i.e., their intent is to mainstream gender. This means that gender is seen as one of many important variables and not an over-arching one. The tools pave the way for energy project planning that provides disaggregated data about the main stakeholders.

INTEGRATED DEVELOPMENT SITUATION

The framework for the integrated development situation (IDS) is shown in Table 3.1. The various components are discussed below.

Conceptualisation

Incorporating gender in energy planning begins at the project conceptualisation stage, when data can be assessed for disaggregation based on gender and other social variables such as income and age. All those involved in problem identification should be gender sensitive. This is the point to assess the gender sensitivity of project staff and adopt appropriate training strategies where necessary.

Problem Identification

Two important tools in project identification are stakeholder and livelihoods analyses.

Stakeholder analysis involves determining who has the resources to participate in the problem identification stage. Gender issues can arise here. Time constraints can prohibit participation in problem identification – and that can be particularly problematic for women, who tend to work longer hours than men and have less spare time for new activities. As a consequence, problem identification can reflect male agendas. Subdividing men and women into separate groups is – or should be – a standard step in stakeholder analysis.

Livelihoods analysis has to reflect the role energy can play in improving men's and women's livelihoods. Men and women have different livelihood strategies and outcomes.

Project Formulation

In the integrated development situation, energy might not be identified as one of the community's priorities but can play an important enabling role providing the services people want, such as lighting, grain grinding, water pumping, crop drying, and vaccine refrigeration. After identifying the community's priorities, which is best done in a consultation exercise although a desk analysis is also possible, the next step should be to assess whether energy technologies can provide a possible solution for those priorities. Insights into which energy technologies are currently in use within a community can be helpful in project design. Why are those technologies in use? Who has access and/or control? For uses of new energy technologies, these sorts of questions can identify which community members are likely to take up new activities and who is likely to benefit, or be disadvantaged, for example, through an added work load (e.g., in biogas projects, when women have to fetch the dung to feed the digester, there is little time saved on fuel acquisition). A quick desk analysis can be carried out to determine whether the options the people (men/women) have identified are (technically) feasible. This type of analysis is an iterative process until a suitable solution has been found.

In the case of energy technologies, one can differentiate between interventions adopted by individual households (e.g., smoke hoods, solar home systems, etc.) and those that have a community aspect (e.g., micro-hydro facilities, communal wood lots, etc.). With the latter, one can distinguish a household component (e.g., a household is connected to the micro-hydro facility) and a community component (e.g., the community installs, manages, and maintains the micro-hydro facility). Each of these requires different sets of questions.

The household-level questions that must be asked include: Who can participate in implementation of the intervention? What constraints might keep the intended target group from being reached? These questions can be broken down further to ensure that there are no discrepancies between i) who will benefit from adoption and the implementation process of the intervention, ii) who has access to key resources that are critical for participation in implementation, adoption of the intervention, and its sustainable use, and iii) who has the power to decide whether the intervention will be adopted or not. It should also be determined what, if any, mitigating interventions are needed to overcome the discrepancies and assure a high chance of up-take of the proposed intervention. Finally, to ensure sustainable use of the energy technology involved, it is important to identify who will be involved in maintenance and repair. Who has the resources (e.g., skills, tools, money) to do maintenance? Is maintenance and repair capacity building necessary to increase women's access in particular? Women are often excluded from training on the maintenance of solar home systems (e.g., topping up the water in the battery) despite being around the household more than men.

The community-level questions involve determining who will be involved in management and maintenance of the community aspect of the intervention. For community facilities, one might need to set up community committees. In that case, it is important to know: Who will be on the committee? Who decides who will be on it? Who is going to be involved in maintenance of the community facility? If current capabilities of men and women are not sufficient, capacity building programmes will be necessary. The water sector found that hand pumps became more sustainable when women were trained to carry out the maintenance even though many men had adequate skills to carry out the required repairs and servicing.

Taking into account different stakeholders within the community and within the household will provide a picture of what groups are able to participate in implementation of the project and will benefit from it. Identifying potential increases in work load, particularly for women, is important in order to take mitigating measures.

These questions can also be used as part of the "alternatives analysis" to determine which proposed intervention can have the greatest positive impact on peoples' lives based on the likelihood of adoption and the nature of the implementation.

Other aspects that can strongly influence the likelihood of adoption are opportunities and limitations created by policies, institutions, and processes. Additional questions are designed to help develop mitigating interventions. Partner organisations should be evaluated for gender awareness and any contracts should reflect gender issues.

Gender indicators, along with standard indicators, need to be developed as an aid to project monitoring and evaluation.

Project Appraisal

At this stage, the proposed interventions should be assessed on whether or not they meet the (initial) gender objectives. This question can be answered by a brief desk analysis. The main question here however assesses how well the various proposed interventions priorities match those of the community. Project appraisal can be participatory, in which case women's NGOs with knowledge of gender and energy should be involved.

Project Implementation

Gender balance needs to be monitored both in project staff and project participants/beneficiaries.

Monitoring and Evaluation

Monitoring and evaluation can be carried out using participatory approaches. Staff carrying out evaluations should have gender expertise and documentation should be assessed to ensure that it covers all relevant gender issues.

Impact Assessment

Impact assessment should be gender disaggregated.

SINGLE ENERGY TECHNOLOGY SITUATION

The framework for the single energy technology situation (SETS) is given in Table 3.2 and is quite similar to the integrated development situation framework. The main differences are at the problem identification stage, so only that step is described here.

Problem Analysis / Project Formulation

The first question in this stage is a desk analysis about the range of possible uses of the specified energy technologies as well as what types of energy technologies are currently in use. However, a desk analysis is not sufficient and the community should be consulted about the possibilities for the proposed energy technology, again looking at both use in current activities and use in new activities. It is also important to tap into the indigenous technical knowledge of both men and women.

An assessment should be made about the likelihood of adoption of the proposed energy technology, which in turn is linked to the priorities of the target group. If it is not a high priority it is unlikely to be adopted, at least within the lifetime of the project.

TABLE 3.1 FRAMEWORK FOR EMBEDDING A GENDER AND ENERGY APPROACH INTO AN INTEGRATED PROJECT PLANNING SITUATION

Planning Process Step		Questions To Be Addressed	Planning Activity/ Tools
Conceptualisation	Background information	Has all background information been disaggregated by age, sex, and ethnic origin?	Desk analysis
		Have those involved with the problem identification been briefed on gender and energy issues?	Desk analysis
	Issue	Is there a gender dimension to the issue being addressed by the project?	Desk analysis and consultations
		What are the differences in energy requirements of any new activities that are planned/desired for women and men? Has consideration been given to doing a gender-sensitive energy needs assessment? What are the energy technology options?	Desk analysis and consultations
		Have individuals and women's NGOs with knowledge and experience of gender mainstreaming participated in strategy development and agenda setting?	Desk analysis and consultations
Problem identification	Stakeholder analysis	Is the analysis based on information supplied only by experts, or does it take into account inputs from stakeholders and end users, including women in the community? What are the energy requirements of any new activities that are planned/desired by men and women?	Desk analysis and consultation if necessary
		What are the opportunities/constraints posed by local cultural practices to the project and project planning? Should women and men be consulted separately?	Desk analysis and consultation if necessary
		What is the difference between women's and men's ability (including resources) to participate during the problem identification stage as well as in other stages of the project cycle?	Consultation
	Livelihood strategy analysis	What are the priorities of women and men to improve their livelihood outcomes? How do women and men prioritise possible livelihood strategies to accomplish this?	SLA study; consultation
		Can energy technologies play a part in achieving these livelihood outcomes?	Desk analysis and consultation; incorporate Indigenous Technical Knowledge (ITK)

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TABLE 3.1 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Problem identification	Livelihood strategy analysis		What current livelihood strategies do women and men use to survive (related to the prioritised ones) and what is the role of energy in these?		Consultation
			Why do people use these livelihood strategies? I.e., what are limiting factors that make women and men use these strategies?		Consultation; incorporate ITK
			What energy interventions will improve the livelihood strategies of women and men? Will women or men be responsible for the activities related to new interventions?		Consultation; incorporate ITK
Project formulation	Current situation, context, and baseline		Are the different roles and responsibilities of women and men documented and understood?		Desk analysis and consultations
			What are the differences of access to and control over resources related to energy and energy services between women and men?		Desk analysis
			Does the project formulation process take into account women's knowledge, especially on ecosystems and biological diversity, as well as biomass for fuel?		Consultation; incorporate ITK
			Has all background information been disaggregated by age, sex, and ethnic origin?		Desk analysis
	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	General	What are the expected positive and negative impacts on women and men as a result of the project? How can the impacts be increased or reduced respectively?		Desk analysis and consultations
			What are the factors (discriminatory attitudes, lack of time, etc.) that may influence women's ability to participate and benefit from the initiative? Has the project consciously and effectively created space and opportunity for women community members to participate in the project formulation?		Desk analysis
		Household / community level	Participation of women and men in implementation and constraints	Have both men and women's views about the various proposed technology options and design features been sought? What are the benefits of the interventions, as perceived by men and women?	Consultation
				Will women and men benefit or be disadvantaged in the same way by the adoption of the proposed interventions and means of implementation?	Desk analysis; consultation

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TABLE 3.1 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Project formulation	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	Household / community level	Participation of women and men in implementation and constraints	What relevant resources related to the intervention do women and men have access to and control over?	Desk analysis; consultation
				Are women or men likely to make decisions regarding the adoption of the proposed intervention and participation in implementation?	Desk analysis; consultation
				How can the intervention ensure access to assets and power to make decision by both women and men? How can women and men use/ benefit from the intervention?	Desk analysis; consultation
				Will women or men be involved in maintenance and repair?	Create scenarios for consultation; be guided by gender objectives
				Is training necessary? If so, what for and for whom?	Consultation
				Have the differences between women's and men's willingness and ability to contribute labour, materials, or money for project activities been determined?	Consultation (daily: time charts; seasonally: seasonal calendars)
				Will the initiative increase women's/ men's/ girls'/ boys' workload during or after the initiative? Are there conflicting demands?	Desk analysis and consultations
			Community institutions and processes to assure sustainable use/ management of the intervention	Are women or men going to be involved in management and under what arrangements?	Create scenarios for consultation; be guided by gender objectives
				Will women or men be involved in maintenance and repair and under what arrangements?	Create scenarios for consultation; be guided by gender objectives
				Do women or men need training in either of these two areas?	Desk analysis; consultation

Continued on next page

TABLE 3.1 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Project formulation	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	Institutional/ national level	Policy, institutional, and process-related constraints	Do the implementing organisations have the capacity to work using a gender perspective? Is the personnel gender-sensitive?	Consultation
				Do existing policies take into account gender?	Desk analysis of relevant policies
				Do existing institutions have a framework for gender-sensitive stakeholder consultations?	Consultations
				Has consideration been given to how the project design will address constraints in policies, institutions or processes?	Desk analysis
			Policy, institutional and process-related needs	Has consideration been given to policy, institutional and process-related reforms to address gender issues related to access to energy services?	Desk analysis and consultations
				Is there a need for capacity building in these areas?	Consultations
	Alternative strategies		In looking at alternative strategies, has there been consideration of the possible benefits of strategies that both promote women's participation and work toward sustainable energy use?		Desk analysis
	Objectives and expected outcomes		Is it appropriate to have specific objectives relating to gender?		Consultations
			Given the proposed interventions, will the livelihood outcomes for women and men change?		Desk analysis
	Logical framework		Are gender issues clearly set out in the logical framework?		Desk analysis
			What activities are required to ensure attention to gender issues?		Desk analysis
			Is there a budget for gender-related analysis and activities?		Desk analysis
			What type of expertise is required to ensure attention to gender issues?		Consultations
	Management arrangements		Do partner or implementing organisations have a commitment to gender equality?		Desk analysis

Continued on next page

TABLE 3.1 continued

Planning Process Step		Questions To Be Addressed	Planning Activity/ Tools
Project formulation	Management arrangements	Are the responsibilities and expectations concerning gender aspects clearly indicated in project documents, agreements, and contracts?	Desk analysis
	Indicators	Are the project indicators gender-sensitive?	Desk analysis with discussions and consultations
		Will indicators be disaggregated on the basis of sex?	Desk analysis
		Have both women and men participated in the development of indicators?	Desk analysis
		Are there indicators to track progress toward meeting specific objectives relating to women's participation, the capacity of organisations to work with a gender perspective, etc.?	Desk analysis
	Gender in project formulation	Have those involved with the project formulation been briefed on gender issues?	Consultation
		How far have individuals and women's NGOs with knowledge and experience of gender and energy mainstreaming participated in project formulation?	Desk analysis
		Do the terms of reference for the project formulation reflect a requirement of relevant gender and energy knowledge and experience?	Desk analysis
		Have women been consulted equally with men during the formulation process, especially female beneficiaries?	Consultation
Project appraisal		What are the views of men and women on the value of proposed interventions and what are their priorities?	Consultation
		Have relevant gender issues been raised at project appraisal meeting(s), ensuring discussion of the impact of the project on gender equality in the country?	Desk analysis
		To what extent have individuals and women's NGOs with knowledge and experience of gender and energy mainstreaming participated in project appraisal?	Desk analysis
Project Implementation		Have all possible steps been taken to ensure gender balance in project staff?	Desk analysis
		Has gender balance in project training been ensured?	Desk analysis
		How far has gender balance among participants in all project meetings been attained?	Desk analysis

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TABLE 3.1 continued

Planning Process Step	Questions To Be Addressed	Planning Activity/ Tools
Project implementation	Do project staff include gender knowledge and experiences in the terms of reference?	Desk analysis
	Do programme staff monitor project disbursements to ensure that inputs are used in ways that ensure equality of outcome for both women and men project/programme beneficiaries?	Consultations
	Have women's groups and women's NGOs been involved in collection and interpretation of data?	Desk analysis and consultations
Monitoring & Evaluation	Is/has the gender objective being/been met?	Verify gender indicators; use participatory M&E.
	Do programme and project evaluations report reflect gender issues, and is information disaggregated by sex?	Desk analysis
	Do final reports systematically identify gender gaps and gender-related project successes?	Desk analysis
	Do the terms of reference of evaluators require gender expertise and experience?	Desk analysis
	Are evaluators briefed on relevant gender issues and provided with documentation?	Desk analysis and consultations
	Will the evaluation consider project outcomes/results with respect to differences in needs and priorities for women and men?	Desk analysis
	Does the assessment incorporate the views of participants and end users, both male and female? Who decides whether a project is successful or not? And what are the parameters for success? Do the monitoring reports capture information on gender-related changes including impact of intervention on women's workload and time use, access and control of income and resources, decision making, reproductive roles, and expressed aspirations of women and men?	Desk analysis
	Will the evaluators seek the input of both women and men and analyse differences and similarities? Is there a feedback mechanism within the project that allows implementers to make course corrections? Are women as able as men to influence effectively any required corrective changes?	Desk analysis
Impact assessment and lessons learned	What were the impacts of the project on women and men?	Desk analysis and consultations
	Will the ex-post evaluation identify "lessons learned" relating to working with a gender perspective in energy?	Desk analysis

TABLE 3.2 FRAMEWORK FOR EMBEDDING A GENDER APPROACH INTO A SINGLE ENERGY TECHNOLOGY SITUATION

Planning Process Step		Questions To Be Addressed	Planning Activity/ Tools
Conceptualisation	Background information	Has all background information been disaggregated by age, sex, and ethnic origin?	Desk analysis
		Have those involved with the problem identification been briefed on gender and energy issues?	Desk analysis
	Issue	Is there a gender dimension to the issue being addressed by the project?	Desk analysis and consultations
		What are the differences in energy requirements of any new activities that are planned/desired for women and men? Has consideration been given to doing a gender-sensitive energy needs assessment? What are the energy technology options?	Desk analysis and consultations
		Have individuals and women's NGOs with knowledge and experience of gender mainstreaming participated in strategy development and agenda setting?	Desk analysis and consultations
Problem identification	Stakeholder analysis	Is the analysis based on information supplied only by experts, or does it take into account inputs from stakeholders and end users, including women in the community? What are the energy requirements of any new activities that are planned/desired by men and women?	Desk analysis and consultation if necessary
		What are the opportunities/constraints posed by local cultural practices to the project and project planning?	Desk analysis and consultation if necessary
		What is the difference between women's and men's ability (including resources) to participate during the problem identification state as well as in other stages of the project cycle?	Consultation
	Livelihood strategy analysis	Given that the project is working with energy technology type X, in what way can it improve livelihood outcomes of women and men either through use in current livelihood strategies or through adoption of new livelihood strategies?	Desk analysis
		What are women's and men's perceptions of the role that the proposed energy technology can play in improving their livelihood outcomes? Will the use of this new technology lead to the adoption of new livelihood strategies?	Consultation; incorporate Indigenous Technical Knowledge (ITK)

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TABLE 3.2 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Problem identification	Livelihood strategy analysis		Given the possible uses of the proposed energy technology, will women and men adopt it to improve their livelihood outcomes?		Consultation; broad-brush Sustainable Livelihoods Approach (SLA)
			What current livelihood strategies do women and men use? What are the energy sources and technologies involved in current livelihood strategies?		Consultation; broad-brush SLA
			Why do people use these livelihood strategies? I.e., what are limiting factors that make women and men use these strategies?		Consultation; broad-brush SLA
Project formulation	Current situation, context, and baseline		Are the different roles and responsibilities of women and men documented and understood?		Desk analysis and consultations
			What are the differences of access to and control over resources related to energy and energy services between women and men?		Desk analysis
			Does the project formulation process take into account women's knowledge, especially on ecosystems and biological diversity, as well as biomass for fuel?		Consultation; incorporate ITK
			Has all background information been disaggregated by age, sex, and ethnic origin?		Desk analysis
	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	General	What are the expected positive and negative impacts on women and men as a result of the project? How can the impacts be increased or reduced respectively?		Desk analysis and consultations
			What are the factors (discriminatory attitudes, lack of time, etc.) that may influence women's ability to participate and benefit from the initiative? Has the project consciously and effectively created space and opportunity for women community members to participate in the project formulation?		Desk analysis
		Household / community level	Participation of women and men in implementation and constraints	Have both men and women's views about the various proposed technology options and design features been sought? What are the benefits of the interventions, as perceived by men and women?	Consultation

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TABLE 3.2 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Project formulation	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	Household / community level	Participation of women and men in implementation and constraints	Will women and men benefit or be disadvantaged in the same way by the adoption of the proposed interventions and means of implementation?	Desk analysis; consultation
				What relevant resources related to the intervention do women and men have access to and control over?	Desk analysis; consultation
				Will women or men make decisions regarding the adoption of the proposed intervention and participate in implementation?	Desk analysis; consultation
				How can the intervention ensure access to assets and power to make decision by both women and men? How can women and men use/benefit from the intervention?	Desk analysis; consultation
				Will women or men be involved in maintenance and repair?	Create scenarios for consultation; be guided by gender objectives
				Is training necessary? If so, what for and for whom?	Consultation
				Have the differences been determined between women's and men's willingness and ability to contribute labour, materials, or money for project activities?	Consultation (daily: time charts; seasonally: seasonal calendars)
				Will the initiative increase women's/ men's/ girls'/ boys' workload during or after the initiative? Are there conflicting demands?	Desk analysis and consultations
			Community institutions and processes to assure sustainable use/ management of the intervention	Are women or men going to be involved in management and under what arrangements?	Create scenarios for consultation; be guided by gender objectives
				Will women or men be involved in maintenance and repair and under what arrangements?	Create scenarios for consultation; be guided by gender objectives

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TABLE 3.2 continued

Planning Process Step			Questions To Be Addressed		Planning Activity/ Tools
Project formulation	External factors and risks Questions pertaining to likelihood of adoption and sustainability of intervention	Household / community level	Community institutions and processes...	Do women or men need training in either of these two areas?	Desk analysis; consultation
		Institutional/ national level	Policy, institutional, and process-related constraints	Do the implementing organisations have the capacity to work using a gender perspective? Is the personnel gender-sensitive?	Consultation
				Do existing policies take into account gender?	Desk analysis of relevant policies
				Do existing institutions have a framework for gender-sensitive stakeholder consultations?	Consultations
				Has consideration been given to how the project design will address constraints in policies, institutions or processes?	Desk analysis
			Policy, institutional and process-related needs	Has consideration been given to policy, institutional and process-related reforms to address gender issues related to access to energy services?	Desk analysis and consultations
				Is there a need for capacity building in these areas?	Consultation
	Alternative strategies		In looking at alternative strategies, has there been consideration of the possible benefits of strategies that both promote women's participation and work toward sustainable energy use?		Desk analysis
	Objectives and expected outcomes		Is it appropriate to have specific objectives relating to gender?		Consultations
			Given the proposed interventions, will the livelihood outcomes for women and men change?		Desk analysis
	Logical framework		Are gender issues clearly set out in the logical framework?		Desk analysis
			What activities are required to ensure attention to gender issues?		Desk analysis
			Is there a budget for gender-related analysis and activities?		Desk analysis
			What type of expertise is required to ensure attention to gender issues?		Consultations
	Management arrangements		Do partner or implementing organisations have a commitment to gender equality?		Desk analysis

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TABLE 3.2 continued

Planning Process Step		Questions To Be Addressed	Planning Activity/ Tools
Project formulation	Management arrangements	Are the responsibilities and expectations concerning gender aspects clearly indicated in project documents, agreements, and contracts?	Desk analysis
	Indicators	Are the project indicators gender-sensitive?	Desk analysis with discussions and consultations
		Will indicators be disaggregated on the basis of sex?	Desk analysis
		Have both women and men participated in the development of indicators?	Desk analysis
		Are there indicators to track progress toward meeting specific objectives relating to women's participation, the capacity of organisations to work with a gender perspective, etc.?	Desk analysis
	Gender in project formulation	Have those involved with the project formulation been briefed on gender issues?	Consultation
		How far have individuals and women's NGOs with knowledge and experience of gender and energy mainstreaming participated in project formulation?	Desk analysis
		Do the terms of reference for the project formulation reflect a requirement of relevant gender and energy knowledge and experience?	Desk analysis
		Have women been consulted equally with men during the formulation process, especially female beneficiaries?	Consultation
Project appraisal		What are the views of men and women on the value of proposed interventions and what are their priorities?	Consultation
		Have relevant gender issues been raised at project appraisal meeting(s), ensuring discussion of the impact of the project on gender equality in the country?	Desk analysis
		To what extent have individuals and women's NGOs with knowledge and experience of gender and energy mainstreaming participated in project appraisal?	Desk analysis
		Have all possible steps been taken to ensure gender balance in project staff?	Desk analysis
Project Implementation		Have women's groups and women's NGOs been involved in collection and interpretation of data?	Desk analysis and consultations
		Has gender balance in project training been ensured?	Desk analysis
		How far has gender balance among participants in all project meetings been attained?	Desk analysis

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TABLE 3.2 continued

Planning Process Step	Questions To Be Addressed	Planning Activity/ Tools
Project implementation	Do project staff include gender knowledge and experiences in the terms of reference?	Consultation
	Do programme staff monitor project disbursements to ensure that inputs are used in ways that ensure equality of outcome for both women and men project/programme beneficiaries?	Consultations
	Have women's groups and women's NGOs been involved in collection and interpretation of data?	Desk analysis and consultations
Monitoring & Evaluation	Is/has the gender objective being/been met?	Verify gender indicators; use participatory M&E.
	Do programme and project evaluations report reflect gender issues, and is information disaggregated by sex?	Desk analysis
	Do final reports systematically identify gender gaps and gender-related project successes?	Desk analysis
	Do the terms of reference of evaluators require gender expertise and experience?	Desk analysis
	Are evaluators briefed on relevant gender issues and provided with documentation?	Desk analysis and consultations
	Will the evaluation consider project outcomes/results with respect to differences in needs and priorities for women and men?	Desk analysis
	Does the assessment incorporate the views of participants and end users, both male and female? Who decides whether a project is successful or not? And what are the parameters for success? Do the monitoring reports capture information on gender-related changes including impact of intervention on women's workload and time use, access and control of income and resources, decision making, reproductive roles, and expressed aspirations of women and men?	Desk analysis
	Will the evaluators seek the input of both women and men and analyse differences and similarities? Is there a feedback mechanism within the project that allows implementers to make course corrections? Are women as able as men to influence effectively any required corrective changes?	Desk analysis
Impact assessment and lessons learned	What were the impacts of the project on women and men?	Desk analysis and consultations
	Will the ex-post evaluation identify "lessons learned" relating to working with a gender perspective in energy?	Desk analysis

3.3 INDICATORS INCORPORATING GENDER AND ENERGY SENSITIVITY

Identification of appropriate gender-sensitive indicators for particular energy projects will depend on an analysis of existing conditions within the target area and an understanding of the differing roles of men and women within that specific culture. Community participation, involving input from both men and women, is critical for establishing project objectives and indicators of success that directly address the perceived needs and goals of the participants and target beneficiaries. When women and women's groups involved with projects define their own indicators for effective participation and sharing in project benefits, those indicators will provide context-specific data relevant to project monitoring and evaluation.

MEASURING IMPACTS OF PROJECTS ON MEN AND WOMEN

Indicators are generally used to measure progress towards the development objectives of a project. In addition, clear and concrete targets help in the formulation of more effective projects. The current emphasis on measurable results is meant to improve the outcomes of development efforts and investments by helping to shape and inform the planning, design, and management of projects. Unless gender considerations are included throughout the design and planning process, and specifically included in the project objectives, they are not likely to be carefully tracked in the monitoring and evaluation of the project's success.

Collection of separate data on men and women ideally should be done at the beginning of the project cycle (at the conceptualisation stage, discussed above, p. 46), starting with a gender-differentiated baseline assessments of existing conditions. Then it will be easier to determine whether there are differing impacts on men and women throughout the project implementation period. Looking at "households" as a category, for example, without differentiating between the separate needs and concerns of the men and women in the household, or between male- and female-headed households, can result in misleading data both about baselines and about project impacts.

Quantitative indicators measure changes over time that can be presented in terms of numbers, percentages, or ratios, such as the number of women holding seats in parliament or the number of girls in school. Quantitative indicators are useful because they are relatively easy to track.

Qualitative indicators, such as changes in opinions and attitudes over time due to project activities, are more difficult to obtain and measure since they may require interviews with participants or surveys of target beneficiaries. Collection of this sort of information, however, can provide important perspectives on the actual effectiveness of a project concerned with an abstract goal, such as gender empowerment, and on why measurable changes occurred. Qualitative analysis might, for example, indicate what sorts of obstacles keep women from occupying more seats in parliament or other decision-making positions.

What is measured often reflects the interests of those who are doing the measurement. A rural energy project might be evaluated in terms of numbers of solar panels installed, or households with improved stoves, or micro-hydro generators installed. Those numbers would be fairly easy to produce and would show the results, over time, that are directly attributable to the project. From the perspective of an engineer, or government energy agency, the view might be "the more equipment in use, the more successful the project." Gender-disaggregated data might show how many men, compared to women, were beneficiaries of the project, but that information might not be of much interest to someone evaluating the project unless gender concerns are somehow linked to the objectives of the project.

If the people or institutions conducting a project assessment are not comfortable with strategies for measuring social impacts or applying a gender analysis, they are less likely to gather or value this sort of data. By placing specific emphasis on gender equality and empowerment of women, as well as poverty alleviation, the Millennium Development Goals help to focus attention on the need for understanding differences in the status of men and women and for measuring changes in gender roles.

PROJECT LEVEL INDICATORS LINKED TO THE MILLENNIUM DEVELOPMENT GOALS

Since the MDGs are meant to set overall international priorities for sustainable development activities, and to ensure that poor people are included in the benefits of development, it is useful to consider developing project-level indicators linked to those targets. In line with the Millennium Development Goals, some general performance indicators for energy-related projects might include the following factors.

Goal 1: Eradicating extreme poverty and hunger

- Number of poor households that are project beneficiaries. Number headed by men/women.
- Income-producing opportunities associated with the equipment. Used by men/women.
- Actual income increases due to project. For men/women.
- Financing available for acquiring the equipment. Used by men/women.

Goal 2: Achieving universal primary education

- Effects of project on primary school enrolment, attendance, and performance. For boys/girls.

Goal 3: Promoting gender equality and empowering women

- Increase in non-agricultural employment and incomes of women.
- Overall increase in women's income.
- Effect of project on time spent by women in household activities.
- Effect of project on total daily workload of women.
- Ownership of productive equipment by women.
- Increases in decision-making power of women in household, community, government.
- Literacy and skills training for women/men.

Goals 4, 5 and 6: Improving health

- Reduction in indoor air pollution.
- Improvements in health clinic facilities and services.
- Changes in the number of visits to health clinics.

Goal 7: Ensuring environmental sustainability

- Increased access to clean water/pumped water.
- Impact of project on sanitation.
- Forest land preserved.
- Reclamation of eroded agricultural land.

These factors will not all be addressed by any particular energy development project. Nevertheless, seriously considering these as possible indicators would lead to the formulation of projects that are geared towards measuring results in terms of gender equality and poverty alleviation. It will also help to make explicit which gender goals are being addressed. The relative importance of these sorts of indicators will vary in different communities, as will the particular constraints and opportunities relating to poverty, gender, and development, so it is important that the people – both men and women – who are expected to benefit from any energy development project be engaged in consideration of these as possible indicators and selection of those most relevant in their particular context.

INDICATORS DEVELOPED IN CONNECTION WITH THE MULTIFUNCTIONAL PLATFORM INITIATIVE[7]

One of the most successful projects selected for analysis in the UNDP Energy and Women Project's book Generating Opportunities: Case Studies on Energy and Women was the Multifunctional Platform project, initiated in Mali, which introduced diesel engines mounted on platforms to provide off-grid energy for rural villages. The engines can be hooked up to equipment to provide a variety of services, including grinding, milling, husking, pumping water, charging batteries, running lights, and powering tools such as welders and saws. By providing a cheap and simple source of energy for rural enterprises, the platforms have improved the quality of people's lives in rural areas and created new income-generating opportunities for both men and women.

Although developed as a poverty reduction strategy, the Multifunctional Platform Project has also become a major vehicle for gender equality and empowerment. In Mali, as in many other developing countries, rural women generally have to use their own physical energy to collect firewood, transport water, and process food, engaging in physically arduous, time-consuming repetitive tasks. Poor rural women are very much in need of substitutes for the use of their own energy and power sources that will allow them to generate income from their labour. The Multifunctional Platform Project is set up so that within interested villages it is women's associations that control and manage the equipment.

7 UNDP and UNIDO, *Energy for Poverty Reduction: The Multifunctional Platform Initiative* (2001).

BOX 3.1 THE MULTIFUNCTIONAL PLATFORM IN MALI

In Mali, the Multifunctional Platform Project provides decentralised energy to rural areas in response to requests from women's associations in the villages. The fundamental energy need for poor rural women in Mali is to find appropriate and affordable substitutes for their own energy, so that they can engage in activities that generate income and that provide benefits for themselves and for others.

The platform consists of a small diesel engine mounted on a chassis, to which a variety of end use equipment can be attached, including grinding mills, battery chargers, vegetable or nut presses, welding machines, etc. It can also support a mini grid for lightening and electric pumps for a small water distribution network or irrigation system. The goal of the project is to install 450 such platforms. Through these platforms it is expected that approximately 8,000 women in rural areas will have access to improved communities and opportunities for improved micro-enterprises. Increased income-generating activities are anticipated. *Source: Burn & Coche (2001); available on line at www.ptfm.net.*

A women's management committee is trained in literacy, bookkeeping, management, and maintenance skills, and then sells energy services to both men and women clients (although women are the primary users).

Referring back to the Millennium Development Goals, the Multifunctional Platform Project can be evaluated by considering the following performance indicators:

Goal 1: Eradicating extreme poverty and hunger

- Increased and diversified income and greater productivity for men and women using the platform's energy services.
- More time for women to engage in income-generating activities.
- More income to purchase food.
- Increased and more diversified food production through reallocation of the time and energy saved by women and girls freed from daily food preparation by hand.

Goal 2: Achieving universal primary education

- Increased school attendance because less need for child labour.
- Increased income used to cover schooling costs.

Goal 3: Promoting gender equality and empowering women

- Girls more able to attend school, perform better, and stay in school longer because the platform is used most for work that would otherwise done by girls.
- Increased income for women leads to greater spending on children, particularly girls' education.
- Women managing the platform acquire literacy skills, greater decision-making responsibilities, and awareness of higher educational and occupational options.

Goal 7: Ensuring environmental sustainability

- Pumping functions of the platform engine provide clean water for drinking and sanitation, and free women from arduous and time-consuming work carrying and processing water.

MEASURING ACTUAL IMPACTS OF THE MULTIFUNCTIONAL PLATFORM[8]

As part of an assessment intended to provide substantive input regarding expansion of the platform project into other countries, a comprehensive study of the impacts of the platform was undertaken in Mali in 2001. With more than 300 platforms in operation in villages in Mali, substantial information about their performance and impacts was obtained through surveys and field visits. Some of the key findings are outlined below.

Reduced time and labour required for household chores

Women in villages where platforms have been installed cite time savings as one of the most important results of having access to motorised power. For example, milling and husking of cereal grains, primary food staples in rural villages, is traditionally done by women and girls using pestles and mortars or grinding stones. Over a week's time, mechanical milling of maize, millet, and sorghum can save women the equivalent of an eight-hour day. Manual husking of 28 kilos of rice would require two nights of soaking, then drying, and then eight hours of manual husking. With the platform engine, the husking operation can be mechanised and done in less than an hour. With the grinding attachment, the platform engine can grind seven kilos of peanuts in ten minutes, work that would otherwise take a whole day without resulting in as finely processed peanut butter.

Increased income generation

Concrete measurements of time and labour saved give a very real flavour to discussions about relieving poverty and empowering women. The same sorts of measurable indicators can be applied to impacts on women's enterprises, such as shea butter extraction, which is a common income-producing activity. The butter can be used for soap, creams, cosmetics, and chocolate manufacturing. The traditional process for producing shea butter from shea nuts involves grinding, roasting, milling, kneading, washing, boiling, and clarifying. Using the platform engine for the grinding and milling operations saves the producers almost four hours over the traditional pounding and crushing. In addition, more butter can be extracted from the nuts, and the quality of the butter is better, so there is more volume as well as value for the product.

Expanded food production for sale and household consumption

Time saved due to the availability of the platform allowed women to spend more time maintaining their individual farms, to increase and diversify their farm production, and to develop small trading operations in agricultural and fish products and prepared condiments. For example, in the Sikasso and Bougouni regions of Mali, the increase in planted areas on individual farms has allowed women to double or triple their rice production, thereby improving household food security.

8 Moussa Diagana, *Impact Study of the Multifunctional Platform on the Living Conditions of Women* (2001); available on line at www.ptfm.net/diaganareport.pdf.

Indicators used to measure increased agricultural production and trading activities include:

- Increased number of market visits by women to neighbouring villages per week. Such visits increased from 1-2 per week to 5-6 per week; women reported that because of the platform their domestic work was reduced and their income-generating activities increased.
- Increased numbers of bus stops to serve higher volume of passengers travelling to weekly markets.
- Increase in quantities of rice sold at markets, where customers prefer rice which is mechanically husked.

Increased education levels for girls

Teachers in villages served by multifunctional platforms reported the following factors related to improvements in girl's school performance:

- Fewer delays in arriving at school due to relief from early morning duties such as pounding grains and drawing water.
- More regular attendance because mothers kept them home less to help with domestic chores.
- Girls less tired when they arrived at school.
- More time for lessons and homework.
- Women's increased revenues allowed them to spend more on children's education and school supplies.

In order to confirm the impacts of the platforms as important factors, the assessment also involved surveys of several villages, undertaking a comparative analysis of boys' and girls' school performances for two years before and after the introduction of the platform's services. Performance indicators included numbers of boys and girls passing to a higher class and comparisons of average scores on evaluation tests.

Adult literacy and training of women

In each village, twenty women designated by the women's association receive professional and adult literacy training to enable them to function as part of the management committee for the platform project. Literacy, technical skills, and accounting proficiency are required to manage the operation of the equipment and payments for the energy services provided.

Increased participation of women in public life

Because the Multifunctional Platform Project requires that the platforms be requested, acquired, and managed by village women's committees, women are necessarily engaged in decision-making processes for the community and in operating equipment which provides essential services for the entire community. Women elders are put forward to negotiate with village councils concerning the establishment of the platforms, to manage conflicts, and to oversee use of the resources generated by the platform.

Other women receive technical training to operate the platforms, which gives them important roles in daily village life. In addition, revenues from the platform operations become important sources of capital for village development.

The Multifunctional Platform Project is an example of how integrating a focus on women's needs and women's empowerment into the objectives of an energy-related poverty reduction strategy can provide a concrete pathway towards reaching the key goals and targets set out in the Millennium Development Declaration. Other types of rural development projects combining activities that provide greater access to energy services with improved food production, education, income generation, and health facilities – for women and men – can also serve as vehicles for achieving the targets established in connection with the Millennium Development Goals.

Further Reading

Guide to Gender Sensitive Indicators, Canadian International Development Agency (1997). Available on line at http://www.acdi-cida.gc.ca/cida_ind.nsf/0/7B5DA002FEAEC07C8525695D0074A824?OpenDocument. The *Guide to Gender-Sensitive Indicators* and the related *Project-Level Handbook* are the final products of a 14-month project researched and compiled by Dr. Tony Beck and Dr. Morton Stelcner with the Division for Women in Development and Gender Equity in CIDA's Policy Branch. The Guide explains why gender-sensitive indicators are useful tools for measuring the results of development initiatives. It concentrates in particular on projects with an end-user focus and shows how gender-sensitive indicators can and should be used in both gender-integrated and women-in-development-specific projects, and in combination with other evaluation techniques.

"Rural Electrification in South Africa: Implications for the Health and Quality of Life of Women," by Angela Mathee and Thea de Witt, in *ENERGIA News* 4, Issue 4 (December 2001). Available on line at http://www.energia.org/resources/newsletter/enarchive.html. The potential benefits of South Africa's rural electrification programme are wide-ranging and have important impacts on women, including reduction in exposure to indoor and ambient air pollution, enhanced health, saving of time, and improved safety, leading to an overall improvement in the quality of life.

Monitoring and Evaluation in Rural Electrification Projects: A Demand-Oriented Approach (Washington, D.C.: Winrock International, The World Bank, and The Mallika Consultants, 2003). Available on line at http://www.worldbank.org/astae/enpogen. The goal was to develop a demand-oriented methodology to monitor and evaluate rural electrification projects and measure socio-economic impacts, with a focus on poverty and gender implications. The result was a research strategy and two different but complementary methodologies useful for rural electrification project design, implementation, and evaluation.

3.4 SAMPLE PROJECT OUTLINES: GENDER AND ENERGY ISSUES IN VARIOUS DEVELOPMENT SECTORS[9]

The following annotated outlines of sample development objectives and activities illustrate the ways in which energy and gender issues are linked to projects in other sectors, and to achievement of the Millennium Development Goals. The examples are intended to be illustrative rather than exhaustive, exploring ways in which gender and energy considerations could affect a variety of development activities, including those related to food security, health, education, and environmental conditions. The outlines are based on a standard format for UNDP project descriptions.

REDUCING HUNGER IN RURAL AREAS THROUGH IMPROVED AGRICULTURAL PRODUCTIVITY

(in support of Millennium Development Goal 1)

Close to 70 percent of poor people in developing countries live in rural areas and depend directly or indirectly on agriculture for their livelihoods. Extreme poverty and hunger push people onto marginal lands and more fragile ecosystems characterised by drought stress and low soil fertility. Increases in agricultural productivity can bring rapid reductions in hunger and poverty.

Gender perspective: Where women are the ones primarily responsible for agricultural growth in developing countries, promoting gender equality and empowering women is important for achieving sustainable agricultural development.

Immediate Objective: Increased food production in areas suffering from drought and erosion

Extreme poverty and hunger push people onto marginal lands and more fragile ecosystems characterised by drought stress and low soil fertility

Gender perspective: About 70 percent of the people in the world living in poverty are women. The most fundamental questions regarding the project design are: Will both men and women benefit from any increase in food production? What additional activities could be added that would be of particular benefit to women? Will some activities actually increase the hardships experienced by women?

Outputs

(1) Improved irrigation systems that deliver water more effectively, increase crop production, and diversify crop choices.
(2) Soil enrichment, resulting in increased crop yields and food supplies.
(3) Increased productivity of value-added activities based on agricultural products.

9 Excerpted from Gail Karlsson, *Integrating Gender and Energy Perspectives Into Sustainable Development Projects* (New York: UNDP, 2003.)

Gender perspective: Are the benefits equitably shared by men and women in the community, or are there cultural or socio-economic barriers that prevent women from participating in the activities?

Activities

(1) Improve availability and efficiency of irrigation distribution systems. Increased food production will have to come mainly from intensified and efficient use of limited resources, particularly water. Productivity on non-irrigated land is generally very low. Improved irrigation services, such as more timely and more adequate water supplies, would particularly benefit the poor.

Gender and energy issues: Would the irrigation systems be used only for fields where cash crops are grown and there is thus income generated to pay for the systems, or would they also be available for household food production plots? If people have to borrow money for the irrigation systems, do women have the same access to credit facilities as men? Would there be water pumps for the irrigation systems? Could they also be used to pump water for household uses, potentially relieving the burden on women and girls carrying water? What sort of energy system would be used for pumping? Could the equipment also be used to provide other sorts of energy services?

(2) Increase levels of soil nutrients by leaving crop residues on the fields. Soil nutrition improvements can be achieved by building up organic matter on land with low fertility.

Gender and energy considerations: Do crop residues currently constitute an important source of biomass for use as fuel? Are substitute fuel sources available? If women are responsible for providing fuel for household uses, would a decrease in availability of crop residues cause additional burdens on women having to search for firewood or other alternative fuels? Would activities to expand access to fuel alternatives be appropriate in connection with this project?

Inputs

(1) Investments of capital and labour in improving irrigation systems and water management plans.

Gender perspective: Would men and women both be able to provide the labour and capital needed to achieve the improvements in irrigation services? Are there time, income, asset, and borrowing constraints that affect women more than men?

(2) Identification of appropriate areas for fertilisation using crop residues. Community education and training programmes and extension services. Implementation of soil nutrient enrichment practices.

Gender perspective: Would women and men have the same access to information, training programmes, and extension services?

Outcomes

(1) More food produced on land where irrigation systems are added or improved.
(2) More food produced on land where crop residues are used for soil nutrition

Gender perspective: Do women obtain an equitable share of the additional food produced? Are there additional physical burdens and time requirements that offset the value of the increased amounts of available food? Are the increases in crop production for cash crops (men's domain) or subsistence crops (women's domain) or both?

PROMOTING PRIMARY SCHOOLING FOR CHILDREN

(in support of Millennium Development Goal 2)

Immediate Objective: Higher education levels for increased numbers of children in rural areas

In developing countries, millions of children receive little or no education, or drop out of school at an early age. Illiteracy denies people the means of escaping conditions of poverty. Basic education is one of the most powerful forces for economic development.

Gender perspective: In most developing countries, literacy rates for women and girls are far lower than those for men and boys. In rural areas, girls are often held back from school to assist their mothers with domestic chores, missing out on education. Women's education can lead to improvements in family health, economic and social status.

Output

(1) More children in rural areas attending primary school.

Activities

(1) Build new schools and classrooms in rural villages. Children are less likely to receive primary education if they have to travel long distances to attend school. More school facilities are needed to ensure that all children have access to primary schools.

Gender perspective: If children have to travel long distances to get to school, boys are more likely than girls to be allowed to go.

(2) Establish distribution systems for cooking fuels to replace traditional fuels.

Inputs

(1) Capital and labour required for construction, outfitting, and staffing of new schools.
(2) Investments and expertise to establish marketing and distribution systems to supply cooking fuels to rural villages

Outcomes

(1) More girls and boys completing primary school education.

Gender and energy considerations: Even when schools are within easy access for children living in rural villages, there may be other factors, including traditional divisions of labour, that keep girls from attending school or make it likely that they will drop out early. In situations where women have no motorised equipment for pumping water, grinding grain, and performing other time-consuming and physically demanding chores, and where they have to spend a great deal of time and effort gathering fuel and water for household uses, they are likely to keep the girls out of school to help with domestic activities. Better access to alternative cooking fuels would relieve some of the burdens on women responsible for finding and carrying traditional fuels, such as firewood, dung, and agricultural residues, and would make it less likely that young girls would be required to stay home to assist with survival activities.

(2) Women relieved of burdens and adverse health effects of cooking with traditional fuels.

REDUCING CHILD MORTALITY IN RURAL AREAS

(in support of Millennium Development Goal 4)

Immediate Objective: Improving household health conditions for children in rural areas

Millions of young children die every year from diseases that could be prevented by changes in household energy practices. Acute respiratory infections related to indoor air pollution are the primary cause of disease and mortality in children under five, causing more deaths and ill health than either malnutrition, diarrhoea, or childhood diseases like measles and mumps.

Output

(1) More children in rural areas living past five years of age.

Activities

(1) Provide information and advice to parents about ways to reduce indoor air pollution from unventilated cooking fires. Women and young children are the ones most affected by indoor air pollution because they spend the most time in homes with unventilated fires. Adverse health impacts from indoor air pollution can be reduced by installing chimneys, vents and partitions for smoky areas, locating kitchens properly to reduce smoke exposure, minimising time spent near indoor fires, and using smooth surfacing for walls, roofs and kitchens so that soot and dust can be cleaned.
(2) Train local entrepreneurs to build, market, and distribute improved stoves and cleaner fuels. Increased access to cleaner fuels for cooking and heating, and to more efficient and less polluting stoves, will reduce children's exposure to smoke, particulates and pollutants such as carbon monoxide, benzene and formaldehyde that are associated with acute respiratory infections.

Inputs

(1) Preparation of educational materials. Trained advisors to conduct community and household information programmes.
(2) Investments in training programmes, market development, and distribution systems.

Outcomes

(1) Fewer children dying from acute respiratory infections.
(2) Fewer women exposed to high levels of indoor air pollution.

PROTECTING THE ENVIRONMENT BY REVERSING THE LOSS OF NATURAL FOREST RESOURCES

(in support of Millennium Development Goal 7)

Immediate Objective: Preserving and restoring forest cover in vulnerable areas

Forests provide a variety of valuable environmental services related to conservation of soil and water in fragile ecosystems, control of desertification and protection of land from wind and water erosion. Forests are damaged when they are over-harvested, over-exploited by forest industries, and when the rural poor, lacking income opportunities, clear forest land for subsistence agriculture.

Gender and energy perspective: In developing countries, women and girls are generally responsible for gathering fuel for household uses. Although fuelwood gathering is rarely the primary cause of forest degradation, scarcity of wood resources forces women and girls to travel farther and spend more time and physical labour searching for and hauling fuel, with serious negative consequences for their health and opportunities for education and productive employment.

Outputs

(1) Environmentally sustainable management of forest areas.
(2) Replacement of trees in degraded forests.
(3) Improvements in efficiency of use of wood fuel for household and productive purposes.

Activities

(1) Establishing community management programmes for vulnerable forest areas. Preservation of forests can be enhanced by management programmes that give local residents rights to use natural resources in the forest for fuel, food and fodder, timber, and other saleable products, and provide incentives to use these resources in sustainable ways.

Gender and energy perspective: Special structures should be put in place to ensure that women have an equal say in the establishment of community forest management programmes and in decisions about resource conservation and use. Due to women's traditional roles in providing for household fuel and food requirements, and their valuable knowledge about local conditions, their input is essential for equitable, effective, and environmentally sustainable resource management.

(2) Planting trees in degraded forest areas.

(3) Stimulating local production and marketing of more efficient cook stoves, ovens, and kilns. Locally available clay, biomass waste products, or other materials may be adaptable for production of more energy-efficient stoves, heating equipment or fuels for household uses, and income-generating activities. Besides the economic and social benefits of lower fuelwood consumption, less fuel burned would mean less local and indoor air pollution, and reduced greenhouse gas emissions.

Gender and energy perspective: Women, in particular, would benefit from the availability of more energy-efficient equipment or products that would reduce the amount of time they spend gathering fuel, reduce their exposure to air pollution, and increase their opportunities for engaging in income-generating enterprises. Women's knowledge regarding use and management of trees and forest products can make an important contribution to environmental planning processes.

Inputs

(1) Government support for granting resource management rights to forest communities. Training and organisation of community men and women in resource management planning and project implementation.
(2) Investments in nurseries, seedlings, fertiliser. Time, labour, and transportation for planting and managing trees.
(3) Consultations with local women and men about available natural resources that could be used for production of more energy-efficient stoves or alternative fuel sources. Training in production methods. Investments in market development and product distribution.

Outcomes

(1) Forests protected by means of community-based sustainable management programmes.
(2) Trees replanted in damaged or degraded forest areas.
(3) Demand for fuelwood decreased.
(4) Greater economic opportunities for local men and women through sustainable livelihoods based on use and protection of forest resources.

FURTHER READING

Integrating Household Energy into Rural Development Programmes, by A. Klingshirn (2000). Available on line at http://www.energia.org/pubs/papers/klingshirnhep.pdf. Despite urbanisation, most people in developing countries still live in rural areas and will continue to do so for the foreseeable future. Agricultural production is the basis of rural economies, but other rural industries such as fish smoking, beer brewing, production of simple agricultural tools, and tea and coffee drying also provide essential livelihoods in most rural areas. Women carry out many of these activities in close proximity to the household. The author argues that since household energy plays a large role in women's work, one of the most effective ways of supporting rural development is by integrating household energy activities into all types of rural development programmes. This article sets out the benefits and limitations of this approach, drawing on practical experiences in development projects in East and West Africa.

Integrating Sustainable Human Development into Project Design: A Good Practice Handbook (New York: UNDP, 2001). Available on line at http://eltree.undp.org/LEservlets/IRS?to=Workspace.0-62285. This handbook was developed in response to demand from UNDP country offices for a simple tool to aid in the task of integrating sustainable human development dimensions into the design of projects. While the original assessment was based on projects in the agricultural sector, participating country offices recommended that the Handbook have a wider application to other sectors. The primary targeted users are UNDP staff charged with responsibility for designing projects and programmes. Secondary users would be the local partners with whom they work and those interested in learning more about how to effectively integrate the sustainable human development dimensions of poverty, gender, participation, and environment. The guide is meant to be used at the conceptualisation stage of a project to aid in successfully incorporating these substantive aspects into project design.

"Household Energy Isn't All About Stoves" by Joy S. Clancy, 1998, *Boiling Point,* No. 41, IT Publications. Available on line at http://www.itdg.org/?id=boiling_point. This article is an important reminder that the demands for household energy go beyond stoves and include energy services for agriculture and so-called cottage industries. The author points out that a good understanding of the way in which agriculture and related activities are influenced by local conditions is necessary to make appropriate energy interventions and gives examples of the multiple use of crops. Attention is drawn to the need to listen to women and to employ a gender analysis of activities, ownership, access, and control over resources.

"Village Power in Solomon Islands," by Nixon Silas Pio and Joina Tutua, in *ENERGIA News* 6, Issue 2 (January 2004). Available on line at http://www.energia.org/resources/newsletter/enarchive.html. This article is a celebration of development by local people for local people. The authors describe how a small hydro project based on the resources of the village has grown into what is now called the Village First Electrification Programme – Solomon Islands, the only active energy programme in the region with a stated gender policy. Paying attention to holistic development in an energy programme, greater local ownership in the processes, and a stronger connection to the social and gender contexts are lesson to be drawn from this experience.

Access to reliable and affordable energy services leads to women's advancement and empowerment. In India, women now have access to solar powered cooking stoves. (Photo: Cherie Hart/UNDP)

4

RESOURCE GUIDE

4.1 GENDER AND ENERGY ISSUES

GENERAL BACKGROUND

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UNDP, Gender in Development Programme, *Gender Mainstreaming Learning Manual & Information Pack: Gender Analysis* (2001). Available on line at http://www.undp.org/gender/infopack.htm.

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UNDP, Sustainable Energy Strategies: Materials for Decision-Makers (2000); see especially chapter, "Gender and Energy: How is Gender Relevant to Sustainable Energy Policies?" Available on line at http://www.undp.org/energy/publications/2000/2000a.htm.

REGIONAL PERSPECTIVES

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